BRITISH JOURNAL OF OPHTHALMOLOGY

PUBLISHED FOR THE

THE ROYAL LONDON OPHTHALMIC HOSPITAL (MOORFIELDS),

THE OPHTHALMOLOGICAL SOCIETY,

AND

THE OPHTHALMOLOGICAL CLUB.

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LONDON:

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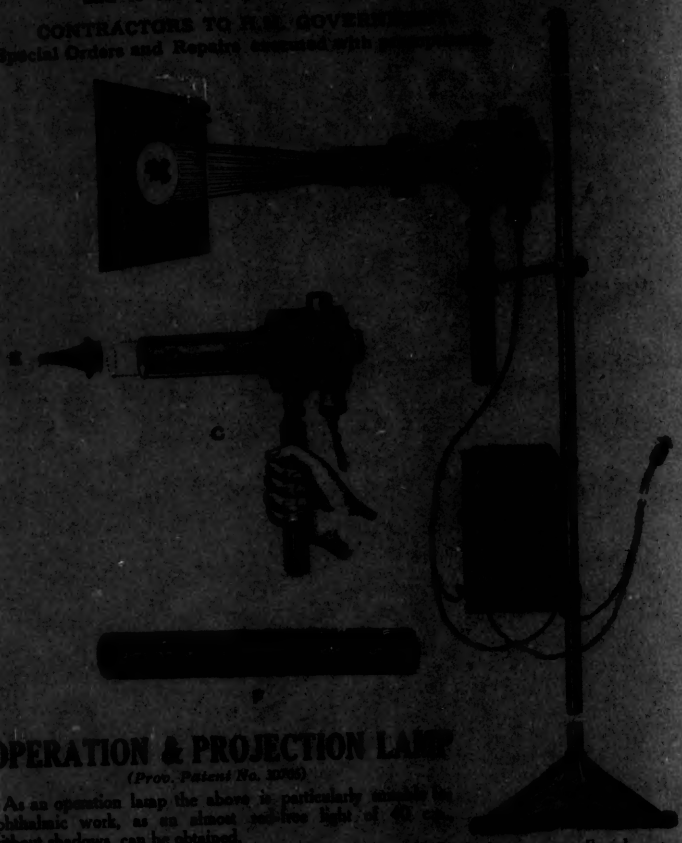

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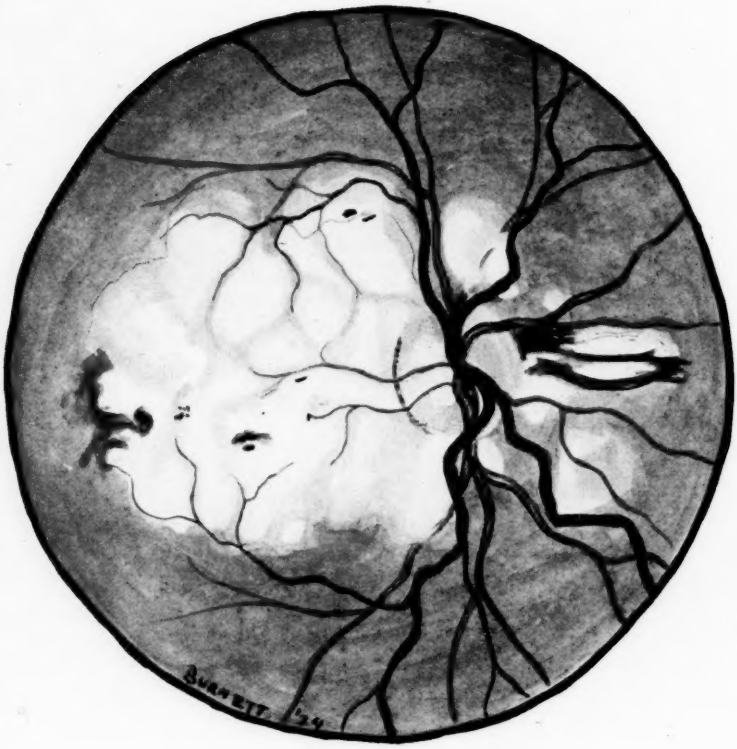

R. Fundus, July 1, 1924.

THE BRITISH JOURNAL

OF

OPHTHALMOLOGY

AUGUST, 1926

A CASE OF TRAUMATIC ASPHYXIA

BY

LEONARD J. C. MITCHELL, M.D., B.S.

OPHTHALMOLOGIST TO THE MELBOURNE HOSPITAL

THIS condition was the subject of a paper by G. J. Heuer in the May, 1923, number of *Surgery, Gynecology, and Obstetrics*, and was noted in the BRITISH JOURNAL OF OPHTHALMOLOGY of May, 1924. On the same day on which I read this note in the latter journal I saw a case in the Melbourne Hospital, the history of which is as follows:

June 26, 1924.—J.C., motor driver, aged 25 years, admitted four days ago, concerned in a motor smash of which no details are to hand save that he was pinned under the car. On admission he had extensive subcuticular petechial haemorrhages which simulated cyanosis, some proptosis, and complete subconjunctival haemorrhages right and left. Patient complained of dimness of vision, left eye slightly blurred, right eye could distinguish fingers. X-ray examination of skull showed no fracture and cranial nerves were normal. There was a compound fracture of right elbow joint.

Fundi: Right, along the lower temporal artery and to inner side of disc are huge masses of white exudate and scattered haemorrhages: the macular area is covered by irregular-shaped dots of exudate. Left showed less marked changes but very numerous haemorrhages and exudate, which exudate is, in right eye, in places in front of the retinal vessels.

July 1, 1924.—R.V., fingers at 1 metre. L.V. seemed to patient to be as usual. He was too ill to test with types for some days.

The water-colour drawing was made on the ninth day after the injury when the exudate had begun to clear in the right eye, while in the left a marked improvement had taken place.

August 26, 1924.—R.V., 6/60 "on adjustment," no central vision. L.V., 6/9 partly. The right fundus showed some persisting oedema in the macular area, but all that remained of the exudate was a tag attached to the lower part of the disc—there was marked pallor of the disc. Left fundus had practically cleared up.

March 10, 1925.—R.V. 6/36; L.V. 6/4. The tag of exudate persists, as does the pallor of the disc (R).

The interest of the case is the early stage at which it was seen and the record of the clearing up under observation of the colossal amount of exudate with a good result as to vision in one eye, *viz.*, the left, which though less affected, showed massive macular changes. Very few of the cases so carefully collected by Heuer show any record of exudate and no cases show anything like the extensive area of exudate figured here (see drawing). Those ophthalmologists who are attached to general hospitals should be alive to the possibility of such retinal changes in severely injured patients, and a few carefully watched cases would soon bring this very rare condition into the realm of carefully recorded retinal pictures.

AIR BUBBLES IN THE VITREOUS

BY

R. FOSTER MOORE

LONDON

CASES of air bubbles in the vitreous appear to be of quite rare occurrence if one accepts the number of reported cases as a criterion. I suspect, however, that they would be discovered not infrequently if they were specifically looked for in suitable cases. The following is an example of the condition and I have previously seen four others:

A man, aged 20 years, was using a hammer and chisel when something flew into his right eye. He came to St. Bartholomew's Hospital with a small sharp-cut puncture about one-third of an inch behind the sclero-corneal junction. On examining him with the ophthalmoscope the vitreous was clear and the two air bubbles, as shown in the accompanying drawing made for me by my House Surgeon, Mr. R. Bolton, were easily seen floating about in it. A steel fragment was removed at once with the giant

magnet, and the eye made a perfect recovery. Next morning no trace of the air bubbles was to be found.

So far as my experience goes, the following are the chief points in connection with the condition:

The entrance of the foreign body must be direct into the vitreous and not by way of the anterior chamber. They must be looked

for within a few hours of the occurrence of the accident. In my cases they have always been multiple, often looking like a string or collection of toy balloons of various sizes in contact with each other. They are soon absorbed.

I had not previously come across a reported case, though I felt no doubt such must have been put on record, and Mr. R. C. Davenport pointed out to me that in the *Roy. Lond. Ophthal. Hosp. Rep.*, Vol. IX, Part 1, page 38, Mr. Stanford Morton had reported two cases. The above points which I have remarked upon were all of them exemplified in both of his cases.

STUDIES ON THE PERIPHERAL RELATIONS OF THE MUSCULUS DILATATOR PUPILLAE*

BY

PROSECTOR O. BERNER, M.D.

COMMUNICATION FROM THE ANATOMICAL INSTITUTE OF THE UNIVERSITY OF OSLO, NORWAY

THE periphery of the iris proves to be a region of the human body whose anatomical conditions have not as yet been properly examined. I got a suspicion of this fact when I was engaged on my examinations of the eyes of some individuals belonging to a family in which miosis congenita occurs.† Since my studies of the miosis were brought to a close, I have examined a great number of eyes which had all been removed by enucleation because of a choroidal tumour, but where the pressure had not increased, for the purpose of studying more particularly the periphery of the iris in the normal eye. The eyes were fixed immediately after the operation, in 10 per cent. formalin, in Zenker's fluid or in formalin-sublimate, and the tumour in the eyes employed did not extend so far forward as to involve the iris. I was supplied with this valuable material by a number of Norwegian, Swedish, and Finnish colleagues.

To begin with I was chiefly interested in finding out the nature of the fixed attachment of the musculus dilatator pupillae, whether this muscle had a "punctum fixum" like other muscles, and where this fixed attachment was eventually to be found. In the last case of miosis congenita I had found appearances that I had interpreted as imperfect rudiments of what I called "anchoring-points" for the dilatator muscle. In the literature treating on the dilatator muscle, Faber is the only one, as far as I can see, who speaks of a "punctum fixatum," and he places the fixed attachment of the dilatator in the walls of the veins of the periphery of the iris. Juler and Huttenbrenner had already described filaments running from the dilatator up to the pectinate ligament, at the time when v. Szily once more described filaments, extending not only up to the pectinate ligament, but right up to the ciliary muscle as well, and characterized these filaments as the "ciliary insertion" of the dilatator. Forsmark says about these filaments to the pectinate ligament and the ciliary muscle *dass sie zweifelsohne selten sind, denn ich habe in meinen Praeparaten kein einziges gefunden.*

The other works, even the leading works, on the dilatator muscle, contain little or nothing about the attachment of this

*Received November, 1925.

†See Holth and Berner in this Journal (*Brit. Jl. of Ophthal.*, p. 401, 1923.)

peculiar muscle. The explanation of this fact can be found only in the extraordinary interest with which was discussed the much-*debated question*: whether the iris has or has not its own *dilatator* muscle. During this discussion attention was paid only to the main *question*, and all details were thrown into the background. *Thus* Grynfellt and Heerfordt say that the dilatator begins where the *epithelium* of the iris joins the epithelium of the ciliary body, and though Forsmark has mentioned filaments radiating into the connective tissue of the ciliary body, he does not attach *much* importance to them. It remains to be said that Grunert had already described such filaments in 1898. Grunert's work is of merit, not only because he was the first to take full advantage of the methods of depigmentation, but also because in his examination he has made use of surface sections and not merely the ordinary radial sections. Grunert considers these filaments in the ciliary body as the fixed attachments of the dilatator muscle. Surface sections have been used by Forsmark as well, but he complained of the series having become defective because of the depigmentation (Alfieri's method).

Already during the seventies, Merkel, Iwanoff, and Jeropheff had drawn attention to and illustrated the peculiar circular bending made by the dilatator fibres in the periphery of the iris. In Merkel's work in 1873 there is found a fine drawing of this.

These things, however, are not described particularly enough in the main works. Thus Heerfordt states that the muscular cells suddenly bend in a circular direction at the ciliary border, without this carrying with it any thickening of the muscle—quite the contrary. I cannot see that Grynfellt describes any change in the direction of the elements at the ciliary border. This is done, however, both by Grunert and Forsmark. Grunert has seen some of the cells bending in a circular direction and forming arcades, while others continued their radial course. His description and illustration are however incomplete. He points out that the periphery of the dilatator is thickened. Forsmark is the one who has studied most closely the conditions of the periphery. His description of it shows that he too has seen in most cases that the dilatator gradually ceases at the base of the iris. Meanwhile, the part of the cell containing the nucleus changes its shape, being stretched laterally, while the nucleus is placed tangentially. This implies a change from radial to circular direction. Forsmark, however, has often seen that this regular course is changed in the *depressions between the ciliary processes,* and that more complicated conditions occur. To begin with, the fibrillar layer is swollen, as he believes owing, generally, to a change of shape caused by pressure. But in other cases the swelling is owing to the existence of muscle cells of the mesodermal type. This kind

of swelling he has found in all the specimens that he has examined from adult persons as well as from children, although the frequency and the extent have varied much. The thickening evidently has something to do with the "strengthening bands" (that also consist of cells of the mesodermal type), and when these approach the periphery of the iris, the muscle cells pass into a circular direction, only some of them retaining the original radial position. Only in exceptional cases he found bundles which had kept their original radial direction and that went beyond the border of the iris.

This short summary as to the periphery of the dilatator muscle was all that I was able to find in the literature, when during the revision of the second case of miosis congenita familiaris I was aware that our knowledge of this region of the human anatomy is very defective.

I began this work believing that in the way in which I carried out the depigmentation I was particularly qualified to succeed in the solution of my problem, because after the depigmentation of the material *in toto* I was able to imbed it in paraffin and to cut long series of it without losing a single section. The fact is that this is generally not obtained by depigmenting the ordinary sections in potassium permanganate, because the sections may easily come loose from the slides. At that time I was ignorant of Dr. Mawas' method of depigmenting with chromic acid, a mode of procedure that is much to be preferred to bleaching in potassium permanganate. While engaged in this work I have realized, however, that for the purposes *now* in question it is *preferable not to depigment the material*. The fact is that the filaments from the dilatator are pigmented, and they differ greatly from the non-pigmented, smooth musculature in the ciliary muscle, a fact which may be of great importance.

My work would certainly not have given remarkable results if I had not examined *surface-sections through the iris and the ciliary body*, and I cannot therefore emphasize sufficiently the importance of these surface-sections. The way in which I proceeded was after the fixation to loosen the ciliary body and the iris from the sclera and then to harden the preparation for some time in graduated alcohol until the iris had grown stiff. After a few days I cut through the iris and the ciliary body, with some fine scissors, from the pupil and right out, and thus I divided the preparation into a convenient number of sections. Then, cautiously, I imbedded these sections in paraffin, and through a little handiness and care the curling of the iris may be avoided. I have thus several series of sections including everything from the pupillary border and right out to the ciliary body, so that *in the same section one has a view of the iris as well as of the ciliary body*. As regards the

methods of staining, I have employed, in addition to the usual methods, the specific stains for connective tissue, such as we have in Mallory's stain, and in Heidenhain's stain with azan. Unfortunately we do not possess a specific stain for smooth-muscle cells. When the question, as so often happened to me during this work, has been to decide whether a single cell or a little group of cells are smooth-muscle cells or cells of connective tissue, this problem cannot be solved in a better way than by trying to stain the myoglia fibrils.

These come out very well in material fixed, as indicated by Benda, in potassium bichromate, nitric acid, or in Zenker's fluid, and afterwards stained with crystal-violet. This method is rather complicated and I have preferred to use Heidenhain's stain, whereby the coarse fibrils appear very distinctly. It must, however, be observed that with a good fixation and staining with Heidenhain's haematoxylin, nerves and elastic fibres will come out as well. Consequently there may come out in the connective tissue some fibrils that one does not always know how to explain. I have therefore stained each series with its special staining and compared the series *inter se*. As regards the azan method I wish to point out that in material fixed in Zenker's fluid, and perhaps especially in material fixed in sublimate-formalin, I have obtained very clear pictures of the fibrils in the smooth musculature. As for the elastic tissue, I have stained according to Weigert's original plan as well as according to Hornowsky's method, and I have obtained good pictures. I consider that the elastic tissue found in the immediate vicinity of the angle of the chamber is of a type that differs from other elastic tissue. The fact is that I have had to stain the sections of the iris for a longer time and with a stronger concentration than was necessary for the control-material (arteries fixed in formalin).

With regard to my results I will begin by pointing out that the description of the periphery of the dilatator muscle, given by Grynfellt and Heerfordt, is not correct. According to these writers, the dilatator begins at the spot in which the epithelium of the iris joins the epithelium on the ciliary processes. Neither of these two investigators has noticed that the peripheral part of the dilatator muscle is nearly always thickened. Heerfordt states distinctly that, if anything, it is thinner than the rest, and Grynfellt points out that this muscle ends both at the pupil and in the periphery *en se continuant avec l'epithelium non modifié de la lame myogéne*. Grunert, on the other hand, has maintained that the peripheral part of the dilatator muscle is thickened, and he has also seen that it radiates into the connective tissue in the ciliary body. According to my experience, the thickening may be lacking in a single section, but will soon reappear in the series.

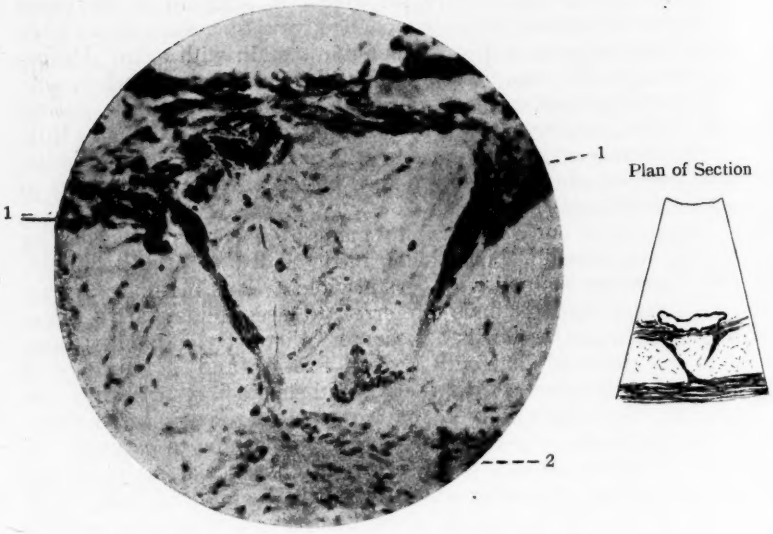

FIG 1.

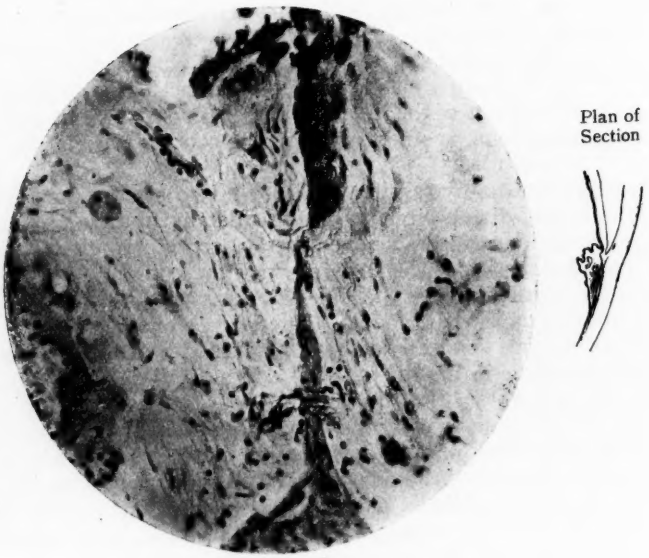

FIG. 2.

Thus I have constantly found the peripheral part of the dilatator thickened, with the long *fillets penetrating into the ciliary body*, but, in contrast to Grunert who emphasizes that their direction is "strictly radial," I must draw attention to the *oblique direction of their course*, as shown in Fig. 1. This oblique course is probably the reason why comparatively few investigators have observed the fillets to the pectinate ligament, as only some of them are seen in the ordinary radial sections. In some cases one may now see in a surface section that the dilatator muscle, through its fillets, is in direct connection with the ciliary muscle. This muscular relation has formerly only been described by v. Szily. What v. Szily has actually seen of these connections is, however, somewhat doubtful, judging from the very outlined drawing he refers to. His material has indeed only consisted of two eyes, and he mentions neither surface sections nor series. From my figure it appears that the direction of the fillets is very oblique and also that the part belonging to the dilatator has pigmented cells, whereas the ciliary muscle is non-pigmented. It is no doubt this oblique direction of the fillets which is the cause of these fillets being very seldom seen in ordinary radial sections. The fact is that in my vast material I have only once seen in the radial sections how the fillet from the dilatator muscle reached up to and merged into the ciliary muscle (Fig. 2).

If one reconstructs these vigorous muscle bridges, from surface sections, graphically, figures will come out similar to those shown in Figs. 3 and 4.

I believe, however, the development of large muscular connections between the two muscles, as seen in Fig. 1, to be comparatively rare. In my material, consisting of about 20 eyes, I have only seen them twice. The shape that the dilatator muscle generally takes in the periphery of the iris is that the thickened rough margin has filaments which extend obliquely towards the ciliary body, but do not reach quite up to the ciliary muscle. The reconstructions also convey an impression of these filaments. Sometimes they divide into single smooth-muscle cells that advance into the connective tissue and may be traced as single cells some distance into the loose tissue between the iris and the ciliary body (Fig. 5). Sometimes, however, the muscle fillet is surrounded with a mantle of connective tissue which is continued outward in the periphery and actually has the appearance of a tendon. In other cases the connective tissue is not so definite that there can be a question of a tendon, but the fine fibres of connective tissue that in these cases extend from the filaments of the periphery of the dilatator in the direction of the ciliary body all produce the same effect (Fig. 6). Some of these fibres attach themselves to the pectinate ligament in the way described by v. Szily and others,

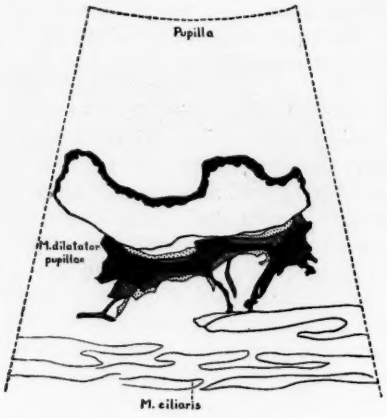

FIG. 3.

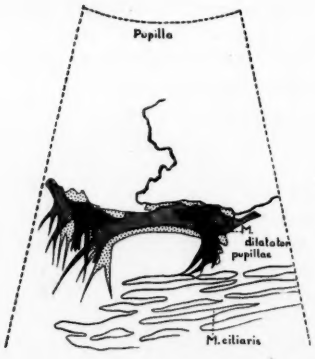

FIG. 4.

Graphic reconstruction of 4 consecutive sections of the series through the periphery of the dilatator muscle, showing the connections between it and the ciliary muscle.

and as shown by me in Fig. 7. If these connections have so far only been described by a few investigators it is no doubt, as mentioned, because the filaments as a rule take a very oblique course (one may say a tangential direction in relation to the periphery of the iris), and consequently they are not to be seen in an ordinary radial section. That my statement is correct is quite apparent, I think, from the surface section, Fig. 6 (see the filaments furthest to the right).

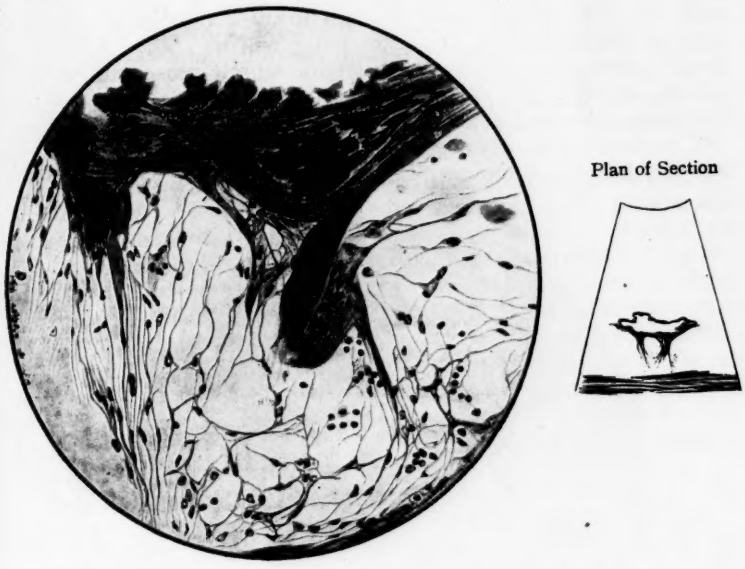

FIG. 5.

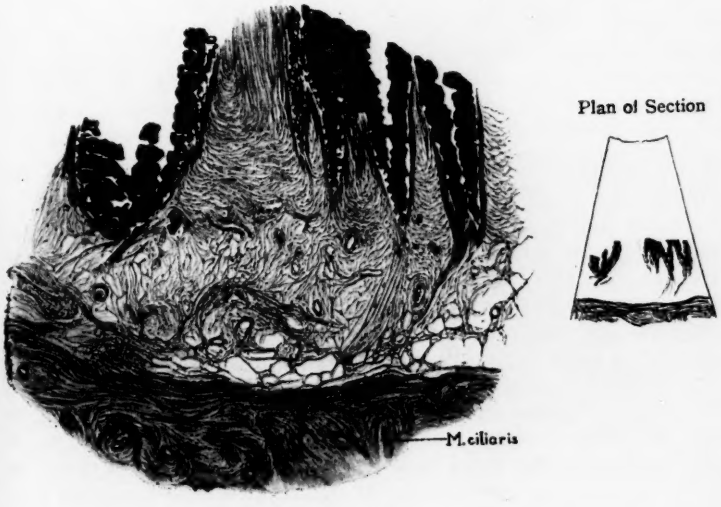

FIG. 6.

If the above description of the periphery of the iris is compared with the descriptions found in the current textbooks of anatomy and ophthalmology, a great difference will be seen. According to the usual descriptions, the dilatator muscle ceases at the base of the iris, and only some few investigators have seen occasional filaments. Forsmark, for example, considers them as exceptions. My experience is, however, that these filaments form part of the normal picture of the periphery of the iris, and, if the previous

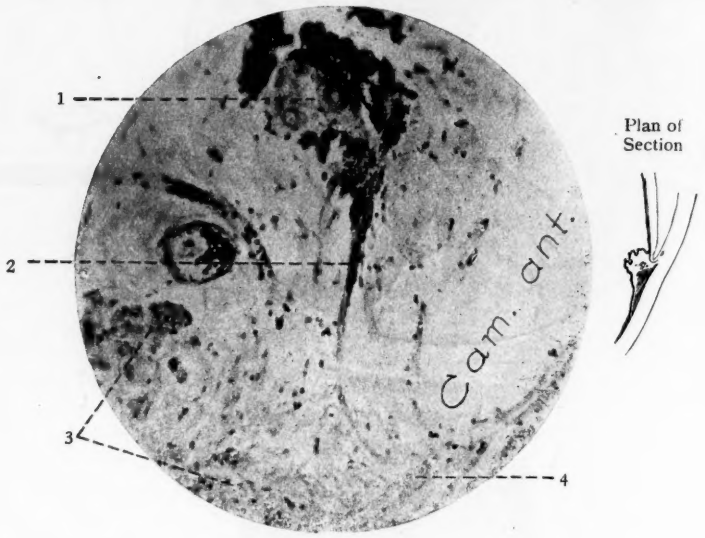

FIG. 7.

investigators have not seen them, it is because they have not studied surface sections.

In my material, however, I have examined an iris from a girl aged 14 years, which was not quite in accordance with the usual picture. In the many series I had of radial sections from this iris, I never found any prolongation of the dilatator muscle in an outward direction, nor was there any swelling of its periphery, similar to what is nearly always found in a normal iris, at any rate if a sufficiently long series is examined. Neither in my series of surface sections were there found pictures quite answering to any of the surface sections that I have reproduced in this work. By examining thin serial sections (surface sections) from this case, I have, however, made sure that in this case also filaments were found from the dilatator muscle traceable out into the loose con-

nective tissue near the angle of the chamber, but they consisted almost entirely of single cells, and only in rare cases of small groups. It must also be observed that the radiating muscle cells nearly always were running very tangentially, and this explains fully why they were not seen in the radial sections. The radial sections from this case were of interest also because it seemed that the muscle of Müller was absent. This, however, proved not to be the case in the surface sections.

The distinct muscular connections that I have found between the dilatator muscle and the ciliary muscle have caused me to examine also the structure of the ciliary muscle. This is all the more natural because the views of the writers as to the structure of this muscle are rather varied. My examinations of the structure of this muscle have conveyed to me the impression that the last word concerning this muscle has not yet been pronounced. A correct view of the structure of this complicated muscle is no doubt only to be had on the base of reconstructions (graphic or plastic). Such I have not yet attempted, however, and on this occasion I confine myself to making some supplementary remarks about this peculiar muscle.

Most authors describe three directions of the course of the muscular bundles in the ciliary muscle, *viz.*, the "meridional," the "circular," and the "radial" or, as called by others, the "oblique" bundles. With regard to the last, I think that the designation "oblique" must be preferable to "radial." The fact is that these bundles run in the direction from the front (from the sclera) backwards and inwards to the so-called "interior plate" of the ciliary body. Salzmann describes this muscle as a network of bundles that are connected with each other. About the bundles running in an oblique direction he says that they have no end, *denn das Gerüst läuft in sich selbst zurück*. The circular part is also described by Salzmann as part of the network and not as *einen selbständigen, von den radialen Portion unabhängigen Anteil*. Szymonowicz speaks about the muscular bundles forming a muscle ring. Schaffer states concerning them that they have an absolutely circular course. Holmgren says that they form "an independent part" of the ciliary muscle. And Rauber-Kopsch says about them that *von Anfang* they have a circular course.

Mawas gives a quite different description of the ciliary muscle. In the first place it must be remembered, he says, that the shape of this muscle varies enormously, not only with increasing years, but also individually. The shape may vary from one section to the other. He describes meridional fibres, extending from the ora serrata forwards, by the name of *longitudinal* fibres, adding that in some eyes are found in addition fibres of an oblique course. As regards the circular ones he says: "*Nous n'avons jamais*

observé de veritables fibres circulaires. Les quelques rares faisceaux coupés transversalement, qu'on observe souvent sur les coupes, représentent à n'en point douter la section des faisceaux obliques."

None of these writers are seen to base their views on the study of surface sections. Their judgment of the direction of the fibres is supported only by the appearance of the nucleus in the muscle cell. If the muscle cell is cut longitudinally, the characteristic long rod-shaped nucleus must appear; if the cell is cut across, a small round, centrally placed nucleus is seen, and if we look at oblique sections, we get pictures forming a transition between these extremes. It is, of course, possible to judge the direction of the muscle bundles from the picture of the nucleus, but it is evident that this method of examination must be inferior to one that permits a view of the whole cell. It is therefore quite obvious that through my surface sections, where the bundles of the muscle of Müller are projected into the design, I am much better qualified to form an opinion on the development and the course of the circular bundles, than if I had confined myself to calculating the conditions from the pictures in ordinary radial sections.

By the references quoted from various writers, it is apparent that the problem which has particularly interested me is that of the condition of the circular fibres. I will state at once that I have arrived at quite another result than that of Dr. Mawas. This investigator denies, as already mentioned, in the most categorical way, the existence of circular fibres. In some human eyes there are only longitudinal fibres, he says, in others oblique fibres may be found, and he believes that these oblique fibres have been taken for circular ones. "*En d'autres termes, il ne semble pas exister, chez l'homme, un sphincter ciliaire distinct. Le muscle ciliaire est un muscle annulaire, épaissi en avant, dont les faisceaux constituants ont une direction prédominante antéro-postérieure, avec quelques faisceaux obliques.*"

My examinations have shown me, however, that muscle bundles running in a circular direction really exist in the ciliary muscle. Their number and development may no doubt change individually, but they always exist, and they are found as a distinct layer which can be traced through several, sometimes many, sections of the series (Fig. 8).

This layer of smooth musculature will most often begin at the top of the series as small and fine bundles, but will increase gradually in order to become, in the most distinct cases, quite large bundles that are all of them running in the same direction, concentrically round the periphery of the iris. When judging of the single section one has of course to consider that the surface section is that of a vaulted organ, whose surface as regards the iris is conical, and this applies to the ciliary muscle too, though the

surface of the latter is perhaps, to speak more accurately, spherical. The result of this fact will be, with regard to both the organs, that microscopical sections cutting the iris and the ciliary muscle in the plane of the iris, right from the pupil and out into the periphery, must necessarily cut through the organs in such a way that the middle region of the iris and the ciliary muscle respectively, will be lying at a deeper level than the outer margins of the sector. Accordingly, when looking at a section like the one reproduced in

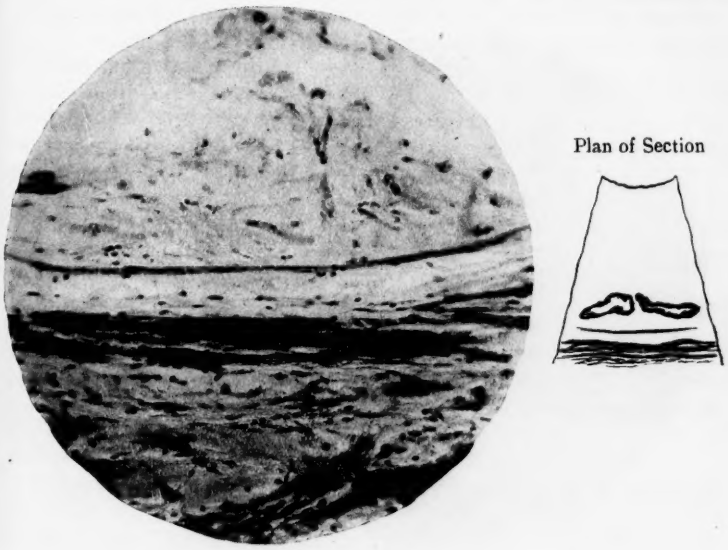

FIG. 8.

Fig. 8, one has to bear in mind that the middle of it represents the conditions deeper down in the ciliary body than do the lateral edges which show us very oblique sections through the bundles round the angle of the chamber. That is why the bundles of concentric, smooth musculature, found in the middle part of the preparation, are coarser than those to be seen towards the outer margins of the section.

Such concentric bundles I have always found in the eyes that I have examined. Therefore I cannot admit that Dr. Mawas is in the right when, in another of his works on the ciliary muscle, he states: "*Dans la même théorie (de Helmholtz), on fait jouer un rôle considérable au muscle circulaire, dit de Müller, muscle qui n'existe pas. . . .*" The concentric muscle bundles are always found in the ciliary muscle, but I agree that in parts at least they

are connected with the oblique or so-called radial bundles. This connection with the obliquely-running fibres does not prevent them, however, when examined in the right way by means of surface sections, from appearing as a distinct, well-defined part of the ciliary muscle. The arrangement of the muscle bundles in this region is quite in accordance with the structure of any other sphincter muscle consisting of smooth musculature. In order to compare, I have cut sections through the pylorus muscle and have been convinced of this fact.

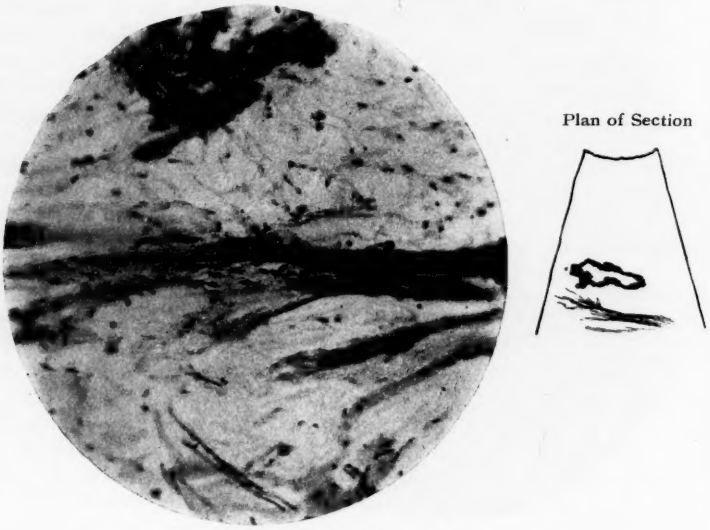

FIG. 9.

These concentric muscle bundles present, however, certain peculiarities with regard to their course, peculiarities that one may suppose are of not a little importance to the physiology of the eye. They are not always found as firm bundles of muscle cells distinctly limited from the surrounding connective tissue. On the contrary, it is seen in the surface sections that the bundles divide into smaller bundles which radiate into the connective tissue; they even dissolve so that the cells radiate into the connective tissue in a way resembling that of the hairs on a brush (Fig. 9). Some of these branchings, sent out from the concentric bundles, take their course inwards to the base of the iris, and it is often possible to make sure that from the top of such a branch a solid bundle of connective tissue extends up to a corresponding filament of the dilatator pupillae. In other cases the bundle dissolves into a group

of muscle cells which disappear in the lax connective tissue beneath the angle of the chamber. In these last cases it is sometimes hard, on account of the technical difficulties with regard to the specific staining of the smooth muscle cells, to say how far the muscle cells can be traced, just as it is also very difficult to decide whether among the fixed cells of connective tissue there do not occur isolated smooth muscle cells as well. Our want of a sure histological method of solving this problem has led me often to ask myself whether or not a cell with a long, rod-shaped nucleus, lying in the lax connective tissue round the angle of the chamber, was a muscle cell? That in Heidenhain's iron-alum haematoxylin method one has a staining which cannot lead to error, at any rate when there occur several cells together, is a fact accepted by all investigators, I think, even if it cannot safely be relied on relative to a single cell, because by this method, as one knows, other fibres will appear after a good fixation. Therefore I have no doubt that, frequently, quite small bundles of smooth musculature will be found, only consisting of some few cells extending concentrically round the periphery of the iris some way out into this peculiar lax connective tissue.

Yet another fact must be mentioned concerning the structure of the ciliary muscle. If one examines closely ordinary series of radial sections, sometimes pictures are seen which show that the circular muscle bundles dissolve and radiate into the loose connective tissue at the bottom of the angle of the chamber. In Fig. 10 I reproduce a micro-photograph showing this fact so distinctly that I believe it speaks for itself.

What importance to the physiology of the eye may be attributed to the anatomical conditions found in the periphery of the iris and in the angle of the chamber? Though the details are not yet accurately known, one may no doubt be able to ascertain that the fluid of the chamber has its outlet through the trabecular tissue and Schlemm's canal. Some of the theories of glaucoma indeed look for the cause of the increased intraocular pressure in the complicated outlet through this canal. Arthur Thomson's "pump-action" theory is even directly to the effect that the fluid of the chamber is pumped out of the angle of the chamber by the working of the intraocular muscles on the interior wall of Schlemm's canal. Without venturing in any way to form an opinion as to the bearings of the filaments indicated by me on the genesis of glaucoma, I will point out, however, that their existence is likely to be of no little importance as to the physiological conditions of outlet in the eye. By every contraction of the circular part of the periphery of the dilatator, there will naturally be exerted a tension on the fibres which end in the trabecular tissue, and the pores of the latter must be opened. In

like manner a contraction of the circular bundles in the ciliary muscle will work on the trabecular tissue through the radiating fibres from the periphery of the iris. I am not only thinking of the displacement of Müller's muscle which is a result of its contraction, nor of the thin, isolated concentric bundles, shown so clearly in Fig. 8, but especially of the radiations from the muscle of Müller of which Fig. 10 represents such a pregnant picture. When my compatriot, Dr. J. G. Raeder, saw this picture, he came to the conclusion that from such anatomical relations between Müller's

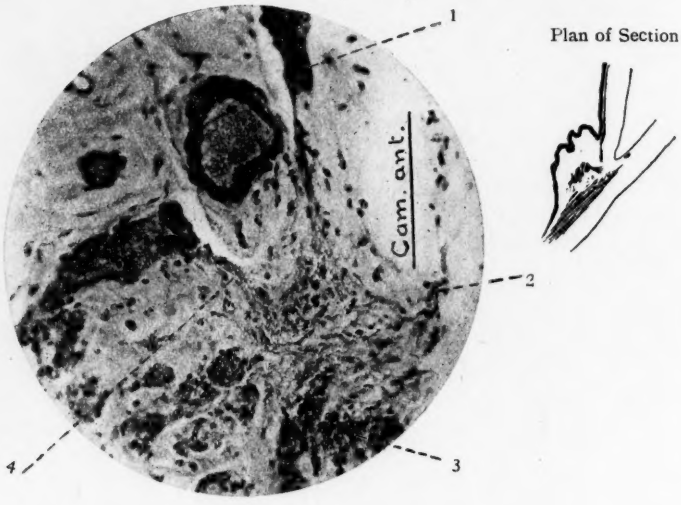

FIG. 10.

muscle and the trabecular tissue there could be deduced an explanation of certain, little noticed, conditions concerning the pressure-diminishing effect of eserin in simple glaucoma. Dr. Raeder has methodically measured the intraocular pressure at five-minute intervals after the instillation of eserin, and he has observed that the lowering of the pressure reaches its maximum after about an hour, when the tension begins slowly to increase again. Such a pressure-curve, by its course in proportion to time, recalls the curve of accommodation after the instillation of eserin, but it is not similar to the curve concerning the size of the pupil. The fact is that the curve of accommodation after the instillation of eserin is already diminishing after an hour, while the miosis remains unchanged for many hours. Consequently, the eserin has a more transitory effect on the ciliary muscle than it has on the sphincter, and as the duration of the pressure lowering effect of eserin (in a

case of simple glaucoma) answers more closely to the contraction of the ciliary muscle than to the stricture of the pupil, it is not unnatural to attribute a pressure-diminishing effect to the contraction of the ciliary muscle. Dr. Raeder's observation is not published yet, but he has allowed me to quote it, as it is of interest in this connection. The observation made by Professor Grönholm that with some persons the pressure is lower after reading may perhaps be interpreted in the same direction.

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NEW FORMED VESSELS IN THE VITREOUS OF SPECIFIC ORIGIN, WITH REPORT OF A CASE WITH DRAWINGS

BY

C. A. CLAPP, M.D., F.A.C.S.

FROM THE DEPARTMENT OF OPHTHALMOLOGY, JOHNS HOPKINS MEDICAL SCHOOL

NEW formed vessels developing in the vitreous have been described frequently in American ophthalmic literature, one of the earliest cases being described by S. Theobald in 1887, which occurred in a woman, aged 52 years, following a haemorrhage into the vitreous.

Marple in 1901 was fortunate in being able to study such a case ophthalmoscopically and later with the microscope, and again ophthalmoscopically in 1906, when another patient presented herself with vessels extending from the nerve-head 8D. into the vitreous. Both of his cases were in women, the first being 50 years of age and the other 63.

Harlan in 1889 reported a woman, aged 50 years, with vessels extending 4D. from the nerve in a large mass, being veil-like in appearance.

Davis in 1912 and Jackson in 1916 reported new formed vessels in young adults of tuberculous origin, and Bell in 1922 one caused by Hodgkin's Disease.

The case I wish to report was an adult male, aged 33 years, occupation, sea captain. His family history and past history

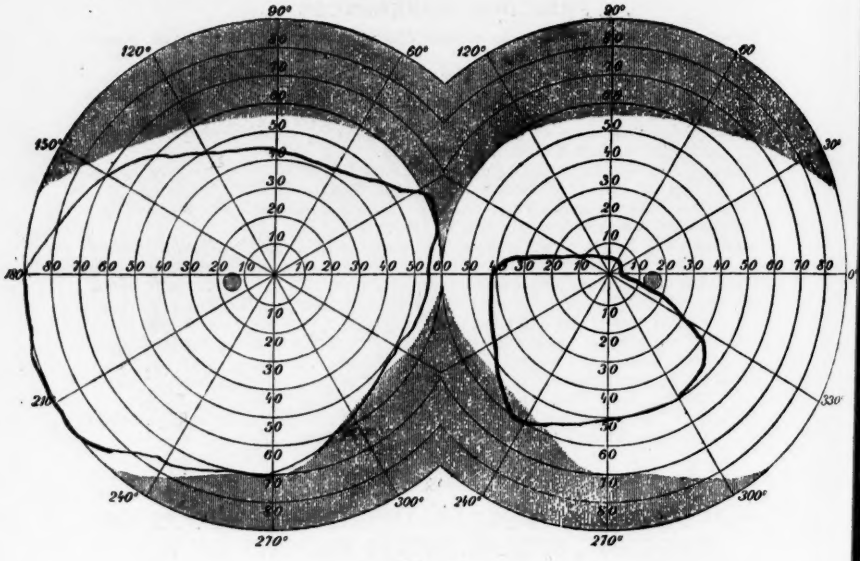

FIG. 1.

Fields of Vision.

were unimportant except his frequent exposure to venereal infection and at one time receiving anti-luetic treatment for a short time and later being told that he never had a lesion. His present history given on January 15, 1920, was that in October, 1919, he had suffered with a severe headache with troublesome spots before each eye and in December, 1919, he noticed that the vision in the left eye was poor and on January 1, 1920, the vision in the right eye was failing. By the use of the eyes of his first mate he was able to make port. On January 15, 1920, the examination showed vision reduced to 15/200 in each eye. The external examination was negative although the pupils were slightly dilated; they reacted both to light and accommodation. Ophthalmoscopically, the right eye showed vitreous slightly cloudy, out-

lines of nerve entirely obliterated with slight elevation of centre of nerve; in and surrounding the nerve-head were numerous haemorrhages and exudates confined chiefly to the fibrous layer, and with extensive retinal oedema. In the lower part of the fundus there was a very large exudate extending out into the vitreous. The left eye showed practically the same changes as

FIG. 2.

Drawing of Right Fundus, August, 1920.

the right with the exception that there was no large exudate in any portion which projected into the vitreous.

His physical examination showed slight enlargement of the tonsils and a markedly positive Wassermann. He was placed in the hospital and started on active anti-luetic treatment. In two months the outlines of each nerve could be made out and vision was 20/100 in each eye, but the right eye showed large haemorrhages below the nerve-head with new-formed vessels. One month later he showed more fresh haemorrhages in O.D., vision being 20/200 right and 20/50 left. Pronounced connective tissue was developing over the right nerve-head with some elevation of the retina.

June 2, 1920. Large detachment of retina below in O.D., with new formed vessels coming out from left nerve-head.

June 18. His vision in O.D. was reduced to fingers at two feet, and with apparently the same condition developing in O.S.

A consultation was arranged with Dr. de Schweinitz who advised removal of tonsils, giving 20 gr. calcium lactate three

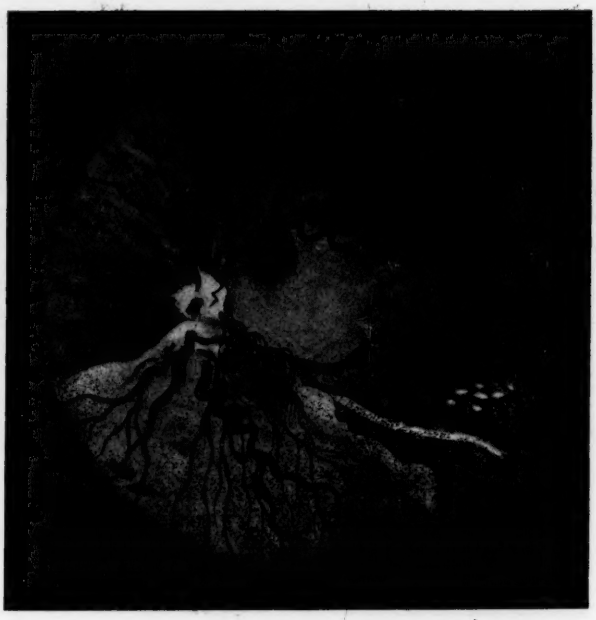

FIG. 3.

Drawing of Left Fundus, August, 1920.

times a day and pushing the iodides and mercury. The medical therapy was carried out but the patient refused the operation advised upon the tonsils.

July 1. His vision in the left had improved to 20/30 plus, and he passed the examination for captain's licence.

On August 17 his eyes presented the picture as seen in the plates. The right nerve was entirely obliterated by connective tissue and the detachment involved the entire nasal side and lower part of the fundus. There were haemorrhages in both the attached and detached retina. Some fine vessels extended into the vitreous about the nerve-head which are not shown especially well in the drawing. The detachment retained considerable colour suggesting

that possibly the choroid was also elevated. The left fundus was even more interesting as the leash of vessels coming out into the vitreous was better seen. These were countless in number and seemed to be closely associated with the large arteries and veins; as they came forward they diminished in size and seemed to end at a focus of eight dioptres. The free extremities seemed to lie in the vitreous and as the eye was moved they would float about with a very slow movement. There was much retinal oedema in the macular region and below the nerve both arteries and veins were very dark and tortuous and definitely elevated, being situated upon a much lighter background; a connective tissue band extended temporally, about which were haemorrhages and exudates. The ultimate outlook of this appeared very grave.

October 5. No apparent change in left fundus except that the haemorrhages were becoming smaller. The detachments in right have continued to increase. Patient had been taking increasing doses of potassium iodide.

November 3. Vision O.S. 20/30. Patient is taking 115 gr. of iodide three times daily.

November 16. Is taking 129 gr. of iodide. Iodide discontinued and given biniodide of mercury.

May 31, 1921. Vision in O.S. with glass (- 1.75D. Sph.) = 20/20.

July 23, 1921. O.D. still shows small area of fundal reflex high up. O.S. still shows new formed vessels in vitreous but haemorrhages are practically absorbed and Wassermann is negative.

January 3, 1922. O.D. still shows small area of fundal reflex up and out. Vision motion. O.S. no change in fundus. Vision 20/20.

January 16, 1923. Vision O.D. motion. O.S. 20/16.

Right pupil bound down with posterior synechiae and lens becoming opaque. No part of fundus can be seen. Left nerve outline obliterated down and out by connective tissue from which small vessels extended 2 mm. into the vitreous. A connective tissue band extends across the fundus horizontally; below the nerve-head at the temporal side there is another group of small vessels which extends forward 7D. No elevation of retina.

April 3, 1924. O.D. light perception; vision O.S. 20/20. Right lens entirely opaque. Left fundus shows practically same picture as that of January, 1924. The fields as shown are as one would expect with the location of the detachments.

The reviewer of the tenth edition of Dr. de Schweinitz's book "Diseases of the Eye," published in the ninth volume page 138 of the *Brit. Jl. of Ophthal.*, apparently doubts the presence of these vessels in the vitreous, as he states "the illustration, Fig. 219, showing new formed vessels in the vitreous must

be of very rare occurrence or else the picture is somewhat misleading."

While I think the condition is relatively very rare yet there is no doubt about its occurrence, and in this case it was undoubtedly the result of lues causing vitreous haemorrhages which were followed by these vascular changes. This condition seems to be quite different from the ordinary picture of new formed vessels as seen in retinitis proliferans, in the innumerable quantity of vessels, variously described as a veil or mass of vessels and in their apparent freedom of attachment except at their base.

Marple's case which came to section showed microscopically the optic nerve fibres extending directly from the papilla forwards into the vitreous. Among these fibres fine blood-vessels were found which were branches of the vessels on the nerve-head. The retina was not detached but connective tissue bands extended forwards and then laterally to the ora serrata.

The nerve fibres extended forwards about 3 mm. in front of which there was a central stalk of new formed vessels supported by a delicate stroma of connective tissue; about 4 mm. behind the lens it branched out and fibres extended to the ora serrata.

In several reported cases the vessels have entirely disappeared, especially if the aetiology were syphilis and treatment were inaugurated.

They apparently may result from vitreous haemorrhages or less frequently from any form of exudate, as one finds reports of syphilis, tuberculosis, diabetes, and Hodgkin's Disease as factors. But syphilis is responsible for about 50 per cent. of the cases.

The reason for the prolific formation of small vessels as shown gives ample room for speculation, but it would seem almost impossible of absolute determination. While Marple's case showed the nerve fibres extending forwards from the optic nerve, that certainly can hardly be the case in these cases which retain 20/20 vision or those in which the vessels disappear.

While the danger resulting from detachment of the retina is very great as exemplified in the right eye of the reported case, the vessels in themselves do not obstruct vision as seen in the left eye which still retains 20/20 vision.

Prognosis.—It would seem from this case history that while the prognosis should be guarded it is not necessarily bad.

Although the vision of the right eye was entirely destroyed and a very grave prognosis made of the left at the time of the extensive detachment and the formation of new vessels, the patient, in the left eye, retains after five years 20/20 vision.

Treatment.—While active anti-luetic treatment is indicated if the case is specific, I am not so sure that the arsenical preparations are those of choice, as it seemed on two occasions that the intra-

ocular haemorrhages were made worse after this treatment, and finally, the improvement seemed much more rapid under mercury and potassium iodide, and the latter was apparently quite a factor in inducing the absorption of the exudate underlying the detachment, thus causing reattachment of the retina.

ANNOTATION

The National Physical Laboratory

The inspection by the General Board took place this year on June 24. The programme of exhibits was fully up to the usual high standard. Those of our readers who were present at the Annual Congress of the Ophthalmological Society of the United Kingdom and availed themselves of the privilege of inspecting the laboratory on that occasion will need no reminder of the value and interest of the work carried on there. The accuracy obtainable by modern physical methods should make a special appeal to the ophthalmologist.

We were particularly impressed by the vector colorimeter. "The object of this instrument is to enable a colour to be specified by *qualitative* measurements involving colour matches only, so as to avoid difficulties inherent in the *quantitative* evaluation of the constituents of a colour match. Briefly, this is effected by locating the unknown colour on a colour chart by the intersection of two vectors. Two colour matches are made. In one the test colour is matched by a mixture of spectrum red with monochromatic light of suitable wave-length; in the other by a mixture of spectrum blue with another suitable monochromatic constituent. These matches determine the two vectors. Having determined the position of the colour on the colour chart, its specification on any of the standard systems is obtainable."

A model was also shown of one of the new rooms in the Duveen wing of the Tate Gallery, which has been constructed to a special design with the object of reducing the effect of reflections in the glazing of pictures. The necessary experiments were carried out at Teddington. This room has recently been opened by H.M. the King, and the method of illumination appears by general consent to be extremely successful.

In the photometry division a hollow sphere ten feet in diameter to be used for measuring the efficiency of fittings used for interior lighting, street lighting, and similar purposes was exhibited. It is believed to be the largest sphere in the world used for this purpose. In the same division was also shown a room lighted through a window covered by translucent paper by an artificial

daylight electric lamp. The effect inside the room was exactly similar to that given by ordinary daylight passing through a window glazed with ground or opal glass, and the effect is singularly restful and pleasing to work in.

The Director, Sir Joseph E. Petavel, F.R.S. and his colleagues are to be warmly congratulated on the varied interest and sustained excellence of the exhibits.

ABSTRACTS

I.—DISEASE OF CONJUNCTIVA

(1) **Fox, Webster (Philadelphia). — The trachoma problem among the North American Indians.** *Jl. of Amer. Med. Assoc.*, February 6, 1926.

(1) **Webster Fox** has interested himself in the trachoma problem among the North American Indians for some years. He states that there are about 400,000 Indians in the United States at the present time, and that it is doubtful if they have ever numbered more since the advent of Columbus. An official survey of the incidence of trachoma among them estimates that about 7 per cent. are infected. A serious attempt is being made by the Indian Office of the Government to ameliorate the effects of the disease, a number of ophthalmologists and nurses having been engaged for this purpose. In addition all the medical officers attached to the Indian Office are expected to make themselves familiar with the disease and its treatment.

Among the American ophthalmologists who are endeavouring to assist in the elucidation of the trachoma problem among the Indians is Francis Proctor. He hopes to get Noguchi to go out to New Mexico to start a trachoma research laboratory, and honoured a British ophthalmologist, with special experience of the disease, with an invitation to give his clinical assistance to Noguchi. If the matter is taken up in this enthusiastic way there is a real hope that progress will be made in reducing the incidence of trachoma, and its more serious sequelae.

A. F. MACCALLAN.

(2) **Collin, L. Ph. (Hue, Annam).—Autoserotherapy of trachoma.** *Revue du Trachome*, January, 1926.

(2) At the Ophthalmological Institute of Hue, **Collin** has made a trial of autoserotherapy in the treatment of trachoma, as recommended by Angelucci of Naples. Collin considers that this

is a long and laborious method of treatment, and inferior to the local applications now in vogue. However, he noted in the cases treated a drying up of the secretion, a diminution of photophobia and pain, and diminution of pannus.

A. F. MACCALLAN.

(3) **Collin, L. Ph. (Hue, Annam).—A trial of the method of Nicati in trachoma. (Essai de la méthode de Nicati dans le trachome.)** *La Clin. Ophtal.*, March, 1925.

(3) **Collin,** practising in a very trachomatous region, has made trial in old-standing, severe and rebellious cases of trachoma, of the method of Nicati, which consists in the employment of "sterilizing injections" of sulphate of copper. There were twelve cases; only two were distinctly ameliorated, four were slightly improved and the remainder not improved. The reaction was very severe and the pain great. The author concludes that Nicati's method, though it may be suitable for recent cases, is untrustworthy in old-standing, severe cases with pannus, and, in such cases, he pins his faith to deep scarification, *brossage*, and instillations of copper sulphate.

ERNEST THOMSON.

(4) **Ziegler, S. Lewis (Philadelphia).—The surgery of trachoma.** *Jl. of Amer. Med. Assoc.*, February 6, 1926.

(4) In **Ziegler's** paper the opinion is advanced that the complications of trachoma are persistently maintained by two mechanical processes: (1) lid friction from blepharophimosis and trichiasis; (2) from perversion of the tears and obstruction of the duct by trachomatous invasion. It is clear that if blepharophimosis or trichiasis exist they must be dealt with surgically, but as a matter of experience they are actually present in a comparatively small percentage of trachoma cases, when several thousand such cases are reviewed. If obstruction of the lacrymal passages occurs, and this again is comparatively rare when thousands of cases are considered, it is due to the extension of the trachomatous process to the lining membrane of the lacrymal sac. No amount of probing as the author advised will alter this condition.

Galvanocautery puncture for the relief of trichiasis (the author means entropion) is advocated, an operation which depends on the formation of eschars and subsequent cicatrization. The effect can be obtained more surgically by a cutting operation under local anaesthesia, such as Streatfeild's operation, which can be performed in five minutes, and from which the dressing can be removed on the fifth day.

The treatment of pannus by peritomy has been largely abandoned by those who have a wide experience of trachoma. This abstention is based on a knowledge of the serious pathological changes in

the nutrition of the cornea which trachoma produces, which are remedied to some extent by the increased vascularity of pannus in old cases (stage 4 and late stage 3). The author advised this procedure and carried it out by the galvanocautery.

A. F. MACCALLAN.

(5) **Zavalía, A. U.—Subconjunctival injections of copper sulphate in trachoma. (Las inyecciones subconjuntivales de sulfato de cobre en el tratamiento del tracoma.)** *Arch. de Oftal., Hisp.-Amer.*, Vol. XXVI, p. 3, January, 1926.

(5) **Zavalía** gives the results of a series of 48 cases of trachoma in all stages of severity treated by the subconjunctival injection of copper sulphate. A solution of 1 per cent. copper is used with novocain, the first injection being of 0.25 c.c., the second of 0.5 c.c., and subsequent ones of 1 c.c. Of the 48 cases he considers 28 cured and 12 very much improved, that is, in 83 per cent. the result is eminently satisfactory; in three improvement was slight; and in five no change could be detected. He concludes that the subconjunctival injection of copper is a very valuable therapeutic measure in trachoma, easy to apply, and without bad after results. It is indicated in all clinical forms of the disease, except in the very acute stages, and in those very chronic conditions complicated by extensive cicatricial deformity, where the difficulty of diffusion of the injected mass renders the procedure impracticable. Early cases can thus be completely and promptly cured; later cases with more extensive involvement are much benefited, corneal ulceration and pannus responding well. A detailed record of the condition and progress of the series of cases is given.

W. S. DUKE-ELDER.

(6) *Revue du Trachome*, October, 1925.

(6) **MacCallan** and **Peretz** have a joint article on the surgical treatment of trichiasis and entropion of trachomatous origin. It contains much the same material as MacCallan's communication on the same subject to the Ophthalmic Convention (*Trans. Ophthal. Soc., U.K.*, Vol. XLV, Pt. 1, 1925).

Colin and **Schweisguth** of the Ophthalmological Institute of Annam state that they have obtained good results in the treatment of early trachoma by the insufflation of vaporized tincture of iodine into the fornices of the conjunctiva above and below; in the case of the superior fornix the conjunctiva is pierced immediately behind the everted tarsus. They say that the injection is painless and that the chemosis produced lasts only two or three days. It would be interesting to learn how this procedure acts on the trachoma which is essentially a disease of the conjunctiva overlying the tarsus and of the tarsus itself.

Jean Sedan has an interesting article on the use of the salts of copper by the Romans in ocular therapeusis.

A. F. MACCALLAN.

(7) **Pavia, L,—A form of conjunctivitis characterized by small scattered follicles. (Conjunctivitis a pequeños foliculos diseminados.)** *Arch. de Oftal. de Buenos Aires*, Vol. I, p. 79, November, 1925.

(7) **Pavia** describes a hitherto unrecognized form of conjunctivitis characterized by follicular formation which cannot be considered trachomatous, which clinically resembles the commonly-occurring follicular conjunctivitis, but differs from it in histopathological characteristics.

Occurrence. The lesion occurs most frequently in tuberculous patients; indeed, according to Pavia, it is in some form almost an invariable accompaniment of this disease, especially in its milder forms—at any rate in South America. The study was made from a tuberculosis hospital, and included 414 patients; in 280 in-patients 208 were affected, and 72 were normal; and in 134 out-patients 110 were badly affected, 18 had slight lesions, and in six only were the conjunctivae healthy.

Clinical Signs. The first symptoms are irritation and itchiness under the upper lid, accompanied by slight photophobia. Secretion is scanty; in the early days there is just enough muco-pus to leave a crust at the inner canthus in the morning, but during exacerbations there may be a profuse discharge. The changes affect mainly the conjunctiva of the upper lid, which always shows considerable injection, and a greater or less number of punctate follicles. The mucosa is often thickened, in which case the underlying Meibomian glands are invisible. With the follicles are often seen numerous minute yellow spots.

Differential Diagnosis. The condition may be diagnosed clinically from other forms of follicular conjunctivitis: from acute follicular conjunctivitis (Axenfeld), and from the vesicular catarrh of Fuchs by the fact that in both of these the formation of follicles is a consequence of an acute inflammatory attack; from the follicular conjunctivitis described by Beal by the presence here of a regular network of papillae over the conjunctivae of both lids; from the common form of follicular conjunctivitis by the fact that here the lower lid and the recesses of the fornices and angles are affected, that there is little injection, and that the separate follicles are more distinct and sharply delimited; from trachoma by the absence of intense injection and inflammatory signs, the enormous conjunctival thickening, the involvement of the tarsus, the development of deformity, and the corneal complications; from vernal catarrh by the lack of the milky-white appearance of the mucosa;

from tuberculous conjunctivitis by the absence of necrotic foci; and from the irritative conditions resulting from the action of vegetable alkaloids, such as atropin.

Pathological Anatomy. The characteristic microscopic appearance is a considerable lymphocytic infiltration of the corium, which may either appear as a uniform stratum, or as isolated masses, the follicular appearance being given by invaginations of the mucosa between them. In some cases the condition may partake of both forms, the follicles being aggregations of a diffuse infiltration. When a regular layer is present the epithelium is histologically normal, except for the invaginations already mentioned which appear on section as glands; immediately underneath it is the layer of lymphocytic infiltration in which are a few mononuclear and occasionally some eosinophile cells. Where follicles are present an accumulation of lymphocytic cells alone is found. Histologically these are to be differentiated from the follicles of chronic follicular conjunctivitis by the presence in the latter of polymorphonuclear and plasma cells and the slight epithelial infiltration, while they lack the typical epithelioid and eosinophile cells of trachoma with the peri-follicular increase of fibrous tissue and new capillary vessels, the giant cells characteristic of tuberculous nodules, and the accompanying epithelial infiltration that occurs with vernal catarrh, Beal's follicular conjunctivitis, and other kindred chronic lesions.

The paper is illustrated by numerous histological photographs, and contains a statistical record of the cases examined.

W. S. DUKE-ELDER.

(8) **González, J. de J.—Vernal catarrh.** (**Periquerato-conjuntivitis exubérante.**) *Anal. de la Soc. Mexicana de Oftal.*, Vol. IV, p. 199, 1924.

(8) In an interesting article which occupies an entire issue of the *Anales* **González** treats the subject of vernal catarrh, from the clinical point of view, exhaustively and authoritatively. The study is based on the observation of 73 personal cases, and the author discusses the literature in detail, and considers the manifestations of the disease not only as it occurs in Mexico, but all over the world. The essential features of the paper are here summarized.

Occurrence. The disease occurs all over the world; in Mexico the incidence is 4 to 5 per 1,000 diseases of the eye; in Birmingham it is much less—1 in 10,000 (Harrison Butler).

Sex. There is great predilection for the male sex—2 : 1—compared with females.

Age. It occurs most commonly in young children. Those below 3 years of age are immune; the highest incidence is between

3 and 13 years of age (78 per cent.); 95 per cent. of cases occur below 20 years of age; and it is almost unknown to begin after 30 years of age.

Incidence. It has a seasonal and geographical incidence depending on temperature; city dwellers are slightly more liable to attack than the country population (the percentage incidence is 56:44); and it shows little class distinction.

There is little evidence of contagiousness; although in some cases several members of a family were affected, in 89 per cent. the cases were isolated.

It is often associated with nasal trouble, adenoids, cervical glands, etc., but 60 out of the 73 cases were in excellent health.

Aetiological Theories. Many have been advanced, but none is satisfactory.

1. Of microbial origin: this is possible, but all research has hitherto been negative. Nor has any parasite been found, although the eosinophilia suggests this.
2. Related to nasal and adenoid trouble, part of a lymphatic dyscrasia. Fifty per cent. of cases show no evidence of this.
3. Due to the action of light, especially ultra-violet light (Krieblich).
4. Due to the presence of a sensitizing agent (haematoporphyrin) in the blood (Junius).
5. Part of a vagotonic constitutional complex (Rossi).

The author thinks that the aetiology is probably composite. While bacterial origin is not excluded, he elaborates the thesis that the evidence in many of the patients of vasomotor, intestinal, cardiac, and emotional instability betrays an endocrine irregularity in youth leading to a vagotonic disposition resulting in a hyperplasia of the lymphatic tissues generally, an eosinophilia, and the production of haematoporphyrin in the blood which sensitizes the conjunctiva to light.

Clinical Features. It is a bilateral affection, characterized by very mild lacrymation and photophobia. In the early stages the signs of diagnostic importance are an injection and hyperaemia of the bulbar conjunctiva, which shows a diffuse dirty yellow colour, and a constant and characteristic irritation. This last is very intense and persistent, and seems almost pathognomonic.

Two diseased foci may develop. At the limbus the conjunctiva shows a blue-grey gelatinous elevation bulging over the cornea, usually limited to the upper segment, having, if it spreads, a predilection for the outer side (the Limbitis of Troncoso). It contains numerous characteristic spots, at first white, then grey, then yellow, comprised of epithelial follicles which rapidly degenerate (Trantas' Spots). On the tarsal conjunctiva of the upper lid a hyperaemia with papillary formation leads to the appearance of

numerous flat nodules, pale pink in colour, of cartilaginous consistency, separated by shallow sulci, giving the appearance of pavement cobble-stones, and leading to a pseudo-ptosis. These are limited to the tarsal conjunctiva, and do not invade the fornices or the lower lid.

The secretion is scanty, and typically contains eosinophiles, a diagnostic point which is to be interpreted with discrimination.

He recognizes the following clinical forms:

1. Bulbar, where the disease is limited to a limbitis, the commonest in Mexico.
2. Tarsal.
3. Mixed, including the lesions typical of 1 and 2.
4. Melanotic, where the yellow pigment is replaced by a melanotic appearance of the bulbar conjunctiva.
5. Rudimentary forms of the above represented by a few tarsal nodules or a small limbic arc, or one or two isolated limbic nodules.
6. Atypical forms, either in size of lesion, when gigantic tarsal or limbal vegetations occur; or in site, when the fornices or plica are affected.

Progress. A slow chronic disease, typically occurring in intermissions, sometimes with a tendency to spontaneous cure. The usual time for a cure he has found to be 3 to 6 years; it has never been less than one, and is seldom more than ten.

Complications. On the whole rarely of great severity.

1. Irregular astigmatism, 11 per cent.; sometimes marked, associated with the limbic lesion.
2. Keratoconus, 2.7 per cent.; especially when the limbitis extends to most of the corneal circumference.
3. Corneal infiltration, 5.5 per cent.; compared by Fuchs to an arcus senilis running parallel to the limbus some distance from it. Not a degeneration but a true infiltration derived from the affected limbus.
4. Marginal ulcers, 2.7 per cent.; associated with the infiltration.
5. A pannus-like extension from the limbus, 2.7 per cent.

Diagnosis. The limbic lesion is to be diagnosed from tuberculosis by the absence of ulceration and the presence of the irritation and itchiness. The tarsal lesion is to be diagnosed from trachoma by the fact that the follicles are cartilaginous in consistency, not soft; they are found on the tarsus only, not in the fornices; they are pinkish-white, not red; they are flat, not rounded; and the secretion contains eosinophiles. Rubbing the conjunctiva with a rod produces pain in trachoma, itchiness in vernal catarrh (Falta's Sign).

Treatment. Surgical treatment—excision and cauterization of the follicles—rarely indicated, and only when they are very exuberant.

Drugs—all caustics and irritants are contra-indicated—copper sulphate, zinc sulphate, silver nitrate. Sedatives to relieve the irritation and injection do much good; the author finds cocain and adrenalin as drops very efficacious. To decrease the proliferation yellow oxide of mercury is useful.

Physico-therapy: the exclusion of light or air acts very dramatically. To exclude ultra-violet light, the author prescribes Crookes' glasses. A change to the cold of a high altitude does good. X-rays are very helpful, but the best therapeutic agent would appear to be radium. Of the 73 patients 27 are cured, the majority after treatment lasting 3 to 6 years, 11 have been lost sight of, and 35 remain under treatment, which in some cases has lasted 10 and 20 years.

W. S. DUKE-ELDER.

(9) **Hoffmann, W.—The histology of vernal catarrh.** (**Zur Histologie des Fruhjahrskatarrhs.**) *Zeitschr. f. Augenheilk.*, Vol. LVI, p. 21, 1925.

(9) **Hoffmann** describes three cases of spring catarrh from the pathological point of view in great detail. They all occurred in youth, the ages of the patients being respectively 18, 8, and 17 years. They had intermissions in the symptoms, but one case continued definitely throughout the winter months.

In each case the upper tarsal conjunctiva was affected. In the first the papillae are described as gelatinous and opaque; in the second as jagged, amyloid, and white; in the third as milky white in colour. In one case only was there any thickening at the limbus, and eosinophiles were found in the smears of one.

Histologically the epithelium over the top of the papillae was thinned, while that between the nodules was much thickened. Immediately beneath the epithelium, over the surfaces of the excrescences, was a thick layer of connective tissue, containing many small pieces of fat. This tissue was highly vascularized, containing many dilated capillaries, surrounding which were many infiltrating cells of varying kinds, among which predominated eosinophiles, plasma cells, round cells, and mast cells. A similar infiltration was found in the pre-tarsal region, and in the tarsus itself there was an infiltration of plasma cells.

W. S. DUKE-ELDER.

(10) **Jocqs, R., and Reinflet, A.** (**Paris**).—**Two cases of conjunctival cysticercus.** (**Deux cas de cysticerque conjonctival.**) *La Clin. Ophtal.*, April, 1925.

(10) Within three months **Jocqs** and **Reinflet** have observed at the same clinic two practically identical cases of subconjunctival cysticercus. The cysts were enucleated and were found to be completely transparent without trace of scolex. One of them,

however, was umbilicated. The authors are satisfied in spite of the absence of scolex that these cysts were cysticercus cysts at their very earliest stage of development. The authors put the cases on record because of the rarity of conjunctival cysticercus and the still greater rarity of two in three months at one clinic.

ERNEST THOMSON.

(11) **Estrada, A. T.—The treatment of eczematous conjunctivitis and keratitis by mercury and arsenic.** (**Conjunctivitis y queratitis eczematosas; su tratamiento por los mercuriales, el salvarsan y sus derivados.**) *Revista Oftal.*, Vol. I, p. 25, April, 1925.

(11) **Estrada** uses the term "eczematous kerato-conjunctivitis" to connote phlyctenular conjunctivitis, "strumous," "impetiginous," "lymphatic," and some forms of "tuberculous" conjunctivitis. The majority of the conditions thus considered are therefore mild, but the term also includes many chronic forms, rebellious to treatment, involving much disability to the cornea, and often gravely impairing vision.

Most of these conditions the author considers have been often too loosely connected with a tuberculous diathesis. He prefers to leave the question of aetiology open, but thinks that syphilis plays a large factor in many of them. He has consequently treated his cases with mercury and arsenic, and he reports very marked improvement in most, especially in the distressing subjective conditions. A bibliography of such treatment is appended.

W. S. DUKE-ELDER.

(12) **Rebay, H.—Tuberculous sclero-conjunctivitis.** (**Esclero-queratitis tuberculosa.**) *Arch. de Oftal. de Buenos Aires*, Vol. I, p. 44, November, 1925.

(12) **Rebay** describes a case of sclero-conjunctivitis interesting from the rôle played by tuberculin in the diagnosis and treatment. The patient, aged 32 years, came under observation first in 1917 with a painful injected focus at the limbus corneae of the left eye over which the sclera was staphylomatous, and adjacent to which there was an area of considerable superficial and deep corneal infiltration. There was a history of syphilitic infection although the Wassermann was negative, and consequently mercurial treatment was given. Two years later the condition was still progressive, the injection had increased, the anterior chamber had become shallow, and posterior synechiae had formed. In the hope that there might be a rheumatic element in the aetiology injections of sodium salicylate were given intravenously with no result. A culture of a piece of the tissue injected into a rabbit gave a negative

result for tubercle, but a course of tuberculin was started, when the patient was lost sight of. Four years later he returned with the scleritis spreading, the staphyloma increasing, and vision deteriorating. Inoculation tests were again negative for tubercle, but on giving tuberculin injections, a sharp focal reaction followed: these were therefore persisted in and the condition rapidly cleared up. A bibliography is appended.

W. S. DUKE-ELDER.

II.—GENERAL MEDICINE

(1) **Ramsay, A. Maitland—The significance of albuminuric retinitis in chronic renal cirrhosis.** *The Practitioner*, May, 1925.

(1) **Maitland Ramsay** reminds us that the general perspective of a case of renal cirrhosis should never be disturbed by assigning to the ocular symptoms an importance out of proportion to the others. The changes in the retina must be regarded as part and parcel of the general disorder.

Prognosis as regards Sight.—This depends upon the site of a haemorrhage and the extent of vascular degeneration. If, as so often happens, the macula is implicated, the patient will be unable to read or to recognize a friend in the street, but the peripheral vision may be quite intact. A haemorrhage in the course of time will be absorbed, but if the cause of the disease is not removed it is prone to recur, and even in favourable cases the effusion of blood may have damaged the macula beyond the power of complete recovery. In a similar manner a haemorrhage into the outer layers of the retina injures the layer of rods and cones, causing a blur in different parts of the field of vision. On the other hand, haemorrhages may occur in the inner layers of the retina (flame-shaped haemorrhages in the nerve fibre layer) and unless they are situated at the posterior pole of the eye round about the macular region, the patient may be unconscious of their presence. Vascular degeneration is more dangerous to sight than haemorrhage, because it is almost invariably progressive, and vision becomes steadily more and more impaired as the arterio-sclerosis increases.

Prognosis with regard to Life.—Albuminuric retinitis is always a late manifestation in the course of nephritis; it is associated as a rule with the phenomena incidental to high blood pressure; its onset is determined by vascular degeneration or by acute general toxaemia or by a combination of both of these conditions. In the cases in which signs of vascular degeneration predominate the prognosis is always grave, because the morbid changes in the blood-vessels are steadily progressive, not only in the arteries

of the retina, but also in those of the brain, the kidney, and other parts of the body—general arterio-capillary fibrosis. On the other hand, where the signs of acute toxaemia predominate a favourable prognosis may be given whenever it is possible to remove the cause of the toxaemia, *e.g.*, toxic retinitis of pregnancy. Numerous cases of recovery from albuminuric retinitis are on record, but their interest depends not so much upon the disappearance of the ocular lesions as upon the fact of the removal of the cause operating both in the eye and in the kidney.

A. F. MACCALLAN.

(2) **Ramsay, A. Maitland (St. Andrews).—Ocular disturbances in functional inefficiency of the kidney.** *Glasgow Med. Jl.*, April, 1925.

(2) "This is not a lecture on diseases of the eye, although it consists of a series of clinical pictures drawn from ophthalmology." **Ramsay** is too modest if he supposes his article will not be of interest to ophthalmologists as well as general practitioners, for it embodies not only the results of his own very large clinical experience but those of other well-known writers on this important subject. If one may condense the article in a few words, its object is to show how renal insufficiency, not always detected by ordinary examination of the urine, may be reflected in the intraocular condition, whether that condition be glaucoma, retinal congestion with transient haemorrhages, central amblyopia, retro-bulbar neuritis, irido-cyclitis, or actual gross lesions due to arterio-sclerosis. And if there is one point which stands out more than others in the lecture it is the extreme importance to the practitioner of a working knowledge of the ophthalmoscope and of the conditions revealed by it which may give the correct clue in many a difficult case of more or less indefinite illness, illness in which, perhaps, there is no actual complaint of visual defect, and in which the true underlying condition is toxaemia.

ERNEST THOMSON.

(3) **Gruter (Bonn).—On the aetiology of impetigo contagiosa, and other herpetic diseases. (Zur Ätiologie der Impetigo contagiosa und anderer herpetischer Erkrankungen.)** Abs. *Zentralb. f. d. gesamte Ophthal.*, July 1, 1924. Heidelberg Congress.

(3) After the examination of a case of keratitis vesiculosa, which later resolved itself into one of keratitis profunda, Gruter assumed the general hypothesis that the herpes virus appears in two modifications, *viz.*, a strong and a weaker one. The strong one produces the keratitis dendritica of man. The weaker one is a cause of various eye diseases, the cause of which has up till now been unknown. Among these are keratitis vesiculosa, keratitis

punctata superficialis, and the relapsing corneal erosion which arises from ruptured vesicles. Further, he claimed that keratitis disciformis, and keratitis profunda, excluding those cases caused by vaccine infection, were caused by the weaker virus. The lecturer proved the identity of the morphologically different pictures by immunity experiments. He succeeded also by a corresponding arrangement of experiments in changing the weaker virus into the stronger one, so producing different pictures with the same virus material.

In conformity with the eyes it was proved that for the skin herpes there were two types of virus. It is impossible to make out from the morphological picture, in the size, number, and arrangement of the different vesicles, which form of the virus they contain.

Vaccination on the eye of a rabbit establishes this. The stronger virus was found in herpes of the lids, the weaker in herpes zoster. It was further ascertained that impetigo contagiosa of man is caused by a mixed infection of weak or strong virus and the different cocci of the skin. It could be further ascertained that there was no relationship between the unknown virus of encephalitis lethargica and the herpes virus. The spreading of the virus takes place from the respiratory or the intestinal tract and thence to other mucous membranes. It can remain latent in certain subjects (virus carriers) and become active if the individual becomes debilitated. The infection to the eye takes place from the conjunctival sac, and gives rise to the herpetic appearances. This then is by ectogenous infection. Blood infection is either of ectogenous origin as in impetigo, or endogenous, as in herpes simplex and zoster. The peculiarity of the zoster type is that the virus has a specific affinity for the nervous system. This quality is found in the strong type as well as in the weak, and is well shown in the clinical picture of the disease.

S. SPENCE MEIGHAN.

(4) **Ling, W. P. (Peking, China)—Ocular changes in Kala-azar in Peking.** *Amer. Jl. of Ophthal.*, November, 1924.

(4) **Ling** examined the eyes of twenty patients suffering from kala-azar—a chronic or subacute febrile affection, characterized by emaciation, anaemia, leucopenia and progressive enlargement of the liver and spleen. The disease is caused by a minute protozoon, the Leishman-Donovan body. Four of his patients showed ocular lesions. There were two cases of xerosis. In the first, a boy under treatment for trachoma, the bulbar conjunctiva was found to be dry and greasy, Leishman-Donovan bodies were found by liver puncture, and the xerosis cleared up after one month's treatment with potassium antimony tartrate. In the second, the corneae were necrotic with a central perforation and

iris prolapse. The bulbar conjunctiva was dry and greasy. There were two cases of haemorrhagic retinitis, characterized by oedema of the retina round the disc margin and the presence of irregularly shaped areas of haemorrhage, disposed, for the most part, along the blood-vessels. In both cases, the haemorrhages disappeared rapidly under treatment and did not recur. Retinal haemorrhages occur in this disease only when there is a marked secondary anaemia.

F. A. WILLIAMSON-NOBLE.

(5) **Lee, T. P. (Peking, China).—Ocular findings in Kala-azar in Central China.** *Amer. Jl. of Ophthal.*, November, 1924.

(5) **Lee**, having seen the cases described by Ling, thought it worth while to control the findings by examination of a larger number of patients. After seeing 140 cases he gives the following summary. Retinal haemorrhages were found in four cases, the haemorrhages being multiple and closely related to the vessels round the disc. Marked anaemia was undoubtedly a factor in their production. Subconjunctival haemorrhages, when they occur, are due to the coughing and vomiting following the injection of potassium antimony tartrate.

F. A. WILLIAMSON-NOBLE.

(6) **Nizetic, Zdravko (Niche).—A contribution to the study of anthrax of the eye and adjacent structures. (Contribution a l'étude du charbon de l'oeil et de ses parties adjacentes.)** *Arch. d'Ophtal.*, July, 1925.

(6) In this article dealing with cases of anthrax of the eyelids and surrounding tissues, under his care, **Nizetic** gives an unpleasant picture of the frequency of anthrax in Yugoslavia. The disease appears to be equally prevalent in Dalmatia and Serbia. In his own hospital service the writer saw 8 cases in 1923 and 5 cases during ten months of 1924. In another hospital serving a population of 60,000 inhabitants there were 14 cases reported in 1922, 8 in 1923, and 5 in the first six months of 1924.

In the treatment of this disease the writer speaks highly of the value of neosalvarsan given in addition to cauterization and other drastic local measures.

J. B. LAWFORD.

(7) **Junès, Émile (Sfax, Tunis).—Xeroderma pigmentosum with ocular lesions. (Xeroderma pigmentosum avec lésions oculaires.)** *Arch. d'Ophtal.*, April, 1925.

(7) Xeroderma pigmentosum is a rare disease. Since Kaposi first described it in 1870, only about 200 cases have been reported.

Of this total Tunis has had eighteen; hence in this not very populous country it is relatively frequent.

Junès' paper is long: in part of it he devotes his attention to the disease in its general aspects and discusses the questions concerning its aetiology such as its relation to congenital syphilis, to the effect of exposure to intense sunlight, and the transmissibility of the disorder from parent to child. The other part of his paper deals with the ocular manifestations. He reports in detail one case under his own observation and gives extracts from the notes of the eighteen other cases which have been recorded in Tunis. The family history of his patient (a girl, aged 7 years, the third child of cousins), gave a definite history of syphilis in the great grand parents. One of these (at once the maternal and paternal great-grandmother) was living and able to relate the history.

The ocular lesions in Junès' patient involved the eyelids and the eyeballs: the clinical description is lengthy and minute, and should be read in the original. Among the lesions was a finely pedunculated tumour of three months growth, attached to the limbus of the left eye and protruding between the eyelids. This was removed and the microscopic appearances are described as sarcomatous in type, showing long fusiform cells with large nuclei and a scanty vascular supply. No pigmented cells were found. The destructive character of xeroderma pigmentosum is well shown in two photographs and there are three drawings of the histological appearances of the tumour. A long and useful bibliography is appended.

J. B. LAWFORD.

(8) **O'Connor, Roderic.—Head pains of ocular origin.** *California and Western Medicine*, September, 1925.

(8) **O'Connor** commences with a plea for fuller examination from the ocular aspect so that early glaucoma or a cerebral tumour may not be overlooked—a state of affairs possible with the work of an optician. The more common causes of head pains are considered under the headings of Pupillary Asthenopia, Refractive Errors and Disturbances of the Extra-ocular Muscles, in the treatment of which latter condition operative measures are most strongly advised when less radical lines do not relieve symptoms. The ophthalmologist who does not undertake tenotomies or shortenings of muscles or who even goes further and warns patients against those who practise such measures is strongly condemned.

By hunting for hidden muscle defects the diagnosis of retinal asthenopia and neurasthenia may be much less frequently made in cases of headache.

R. C. DAVENPORT.

(9) **Carreras, B. (Madrid).—Ocular symptoms in epilepsy. (Contribucion al estudio de los sintomes oculares en la epilepsia.)** *Anal. de Oftal.*, Vol. I, No. 3, pp. 163-175, 1925.

(9) The occurrence of a case of epilepsy with rare complications in his clinic has induced **Carreras** to summarize the literature of the ocular manifestations of the idiopathic form of this disease. His case presents the following interesting features:

1. Complete paralysis of accommodation; the pupils, which were 4 mm. in diameter, reacted well to light, to convergence, and consensually. Such an occurrence is very rare; it has been reported by Hertel in three cases. Other dyscrasias in which this isolated paralysis is found to occur are, commonly, diphtheria, syphilis, botulism, and influenza; rarely, measles (Dreisch), scarlet fever (Schmidt Rimpler), typhus fever (Stephenson), and hysteria, and more rarely still, mumps (Baas), and dental infections.

2. Ophthalmoscopically the right disc was pale, resembling the picture of post-neuritic optic atrophy; the left disc, on the other hand, was hyperaemic, showing large dilated veins. On both discs there were large irregularly shaped haemorrhages. The field on the right side was much contracted, that on the left showed little impairment. Each one of these features is rarely met with in essential epilepsy, and their occurrence in one case is remarkable. The author concludes that the retinal haemorrhages are due to venous engorgement, occurring presumably during a seizure.

W. S. DUKE-ELDER.

(10) **Nicholls, Albert (Halifax).—Some thoughts (old and new) on arterio-sclerosis.** *Canadian Med. Assoc. Jl.*, November, 1924.

Addison, W. L. T. (Toronto).—The use of calcium chloride in arterial hypertension. *Canadian Med. Assoc. Jl.*, November, 1924.

Bicak, Joseph F. (New York).—High blood pressure treated with sensitized colon vaccine. *New York State Jl. of Med.*, March, 1925.

(10) Arterio-sclerosis being a disease frequently discovered by the ophthalmic surgeon during a routine examination of the fundus, an abstract of the above-mentioned articles may be of interest.

Nicholls confines his remarks to arterio-sclerosis proper, "that form of arterial degeneration which comes insidiously, is the product of years, and of which the causes are as yet imperfectly apprehended." The aorta contains a very large proportion of

elastic tissue, the smaller vessels less, and the arterioles are made up chiefly of muscle. The three anatomical varieties of arterio-sclerosis are more or less correlated with these varieties in structure of the vessels. (1) The nodose, due to a fibroid thickening of the fatty intima which in the later stages becomes still thicker and converted into dense almost hyaline connective tissue with necrosis of the deeper portions, and some calcareous change. This type of disease is found in the larger arteries; (2) Mönchberg's sclerosis, common in the peripheral arteries, especially of the extremities. In these cases the media is principally affected and undergoes calcareous degeneration, the calcified material being laid down in rings; (3) endarteritis obliterans—improperly so called as it is not a primary inflammation—characterized by enormous thickening of considerable extents of the vessel walls. This causes marked diminution of the lumen and may progress to obliteration of the vessel. The smaller arteries and arterioles are those involved in the progress. From the aetiological aspect Nicholls divides the cases into the senile, toxic, and hyperpietic groups. Heredity has also a marked influence in bringing about early development of arterio-sclerosis. Of the toxic causes, chronic staphylococcal infection is probably the most important. The evidence with regard to alcohol is conflicting; Edgreen, Hisch, and others believe that it is an important aetiological factor, while Romberg and Cabot can find no special relationship. The effect of constipation is to bring about putrefactive changes in the colon with the formation of diamines which have a direct effect in raising the blood pressure. Cholesterin is also thought to have an important rôle, since giving this substance to rabbits, produces changes simliar to human arterio-sclerosis, and if the blood pressure be artificially raised, less cholesterin is required to produce the same effect, though rise of blood pressure alone will not produce the characteristic lesions. Cholesterin in the blood is increased by a diet rich in lipoids such as meat, milk, butter, and eggs. Treatment therefore should be on the following lines: search for toxic absorption from the teeth, tonsils, accessory sinuses, appendix, and intestinal tract generally. Correct constipation and draw up a moderate dietary, avoiding large quantities of eggs, milk, and butter.

Addison's work is based on the following experiments: The first by Chari and Froehlich of Vienna who found that a cat, reacting normally to adrenalin, if injected intravenously with a suitable solution of oxalic acid, has its blood pressure raised immediately from 110 mm. Hg. to 180-190 mm., and does not react further to adrenalin. If a corresponding solution of calcium chloride be now injected intravenously the blood pressure returns

to 110 mm. Hg. and the cat reacts normally to adrenalin. The second by Roeseman of Vienna who found that if smooth muscle be placed in a calcium-free Ringer's solution, the tonus of the muscle increases as calcium is added until the normal calcium concentration is reached, further increase of calcium causing progressive decrease of tonus. Addison was thus led to believe that hyperpiesis in human beings might be controlled by massive doses of calcium. He gives details of ten cases so treated. Calcium chloride was administered in amounts varying from 150 to 180 grains *per diem* with marked success. A typical case is that of a man with retinal haemorrhages and two reputed cerebral haemorrhages whose systolic blood pressure varied from 220 to 250 mm. Hg. Within three weeks of taking the calcium his blood pressure was down to 176 and a fortnight later it was 172. Occasionally the calcium may produce nausea and a sense of muscular weakness, if toleration is not developed it is advisable to use magnesia instead.

Bicak gives details of 23 cases with high blood pressure "taken without any selection whatever, and treated by subcutaneous injection of a sensitized vaccine of the colon bacillus 2,000,000,000 to the c.c." Exact details of dosage are not given, but apparently the first dose was about one minim, the later doses being increased and given every two or four days. Thus one reads of one patient receiving four injections amounting to five minims, another six injections, amounting to 11 minims and so on. In his conclusions Bicak notes the following: Improvement was prompt in all cases and marked in most. Several became uncomfortable when the pressure was reduced quickly but this discomfort was only temporary. Hyperpiesis is probably due to coli toxaemia because: (1) It was improved in all cases by the vaccine treatment; (2) when the pressure reaches normal vaccine treatment does not reduce it further; (3) dizziness is a symptom common to the three conditions of hypertension, constipation, and indigestion.

F. A. WILLIAMSON-NOBLE.

(11) **Watson-Williams, E. (Clifton).—A case of latent nasal accessory sinus disease with mental and visual impairment; operation; recovery.** *Lancet*, December 20, 1924.

(11) The special interest to ophthalmic surgeons in this case is the fact that impairment of visual acuity (R. 6/12; L. 6/24), and reduction in the extent of the visual fields, without scotoma, took place in a man, aged 42 years, who suffered from double purulent disease of the antra, and that visual acuity of 6/5 was obtained along with partial recovery of the fields after operation

(antrostomy). The mental condition also, which had previously threatened the asylum or the prison, was restored to normal.

ERNEST THOMSON.

(12) **Savin, L. H. and Preston, T. W. (London).—The problem of the phlyctenular child.** *Lancet*, May 9, 1925.

(12) The very interesting investigation of **Savin** and **Preston** into the family and personal histories of fifty consecutive cases of phlyctenular disease and into their physical state, more especially with regard to the possibility of the presence of tubercle, seems to add—and it is probable that the authors will not object to the suggestion—to the negativity of our knowledge of this disease. "There is a great body of opinion that phlyctenules are due to tubercle. . . . Under the circumstances we thought our phlyctenular cases would offer a rich field for the study of tubercle. We have been disappointed." The authors have succeeded in condensing so much into a few columns of the *Lancet* that it is quite difficult to do their work justice in an abstract of reasonable length. We must therefore be content to give only the outstanding points. Every oculist will do well to read the original, and if he has been puzzled over the causation of these cases he will be comforted to find that, after what appears to have been a fairly exhaustive investigation of the physical state of these fifty cases, the authors have to say at the end that "phlyctenular conjunctivitis is a disease of unknown aetiology."

The authors deal in the first place with their statistics of their case records and pick out a few of them for publication of details. Three of these constitute the foundation of a statement in the very closing words of the article, namely, "there seems to be reasonable ground for attributing the cause to endogenous toxaemia." These three cases are (1) a boy, aged 15 years, phlyctenular since ten years. Tonsils and adenoids having been removed and the antrum drained, the phlyctenules disappeared; (2) a woman, aged 25 years, pregnant, phlyctenules for the first time, phlyctenules disappeared the day after birth of child; (3) a girl, aged 17 years, the phlyctenules always appeared three days before menstruation.

In discussing their results the authors say that in many phlyctenular children there is no evidence to be found of tubercle either clinically or in the laboratory. Again, whereas tuberculosis is a disease without any very marked seasonal incidence, the phlyctenular cases investigated showed a very marked preference for the months about May and June and were at a minimum in August. The authors think, however, that the graph they reproduce may contain fallacies due to extraneous causes such as holidays, and ask for graphs to be made by other observers.

With regard to age incidence, the average was 10.4 years, and the oldest 25 years. They state that cases of phlyctenular conjunctivitis at over 30 years are almost unknown (though the reviewer thinks this is too strong a statement). Tuberculosis, on the other hand, occurs at all ages. Phlyctenular conjunctivitis is a disease of the hospital class. Tubercle is no respecter of persons. "It seems probable, therefore, that while tubercle may be present in many phlyctenular cases, it is not an essential factor in the causation of the disease. It is not disputed that tubercle may be a predisposing cause; but there is little to prove that it is anything more." The authors then reviewed their fifty cases from the standpoint of previous illnesses, possible sources of sepsis, etc., of which they had exhaustive notes. They compared the fifty cases with fifty normal refraction children of corresponding average age, and found that certain common childrens' diseases were quite ruled out as possible causes of phlyctenules. The graph shows that as regards measles, whooping cough, chicken-pox, pneumonia, German measles, and mumps, the control series had been quite as much affected as the phlyctenular. On the other hand more phlyctenular children had suffered from running noses and ears, and many more suffered from or had had removed, large tonsils and adenoids. This was confirmed by the examination of a further fifty controls. The home conditions were investigated and it was found that the more children are overcrowded the more they are predisposed to phlyctenules. Dental sepsis and intestinal toxaemia did not play an important part but malnutrition acted as a predisposing cause. The authors investigated the diet and found a great excess of carbohydrates. This is well illustrated by the pathetic replies of two children to the question what they would like to eat as a "luxurious feast." One replied: "A lot of bread with some real butter and a very large piece of cheese." The other wanted a steak and kidney pudding and a pint of stout.

The authors consider that their investigations tended to discredit the theory that phlyctenular conjunctivitis is always an outward manifestation of "tuberculi-toxaemia," and that the true aetiology of the disease is unknown. Their conclusions may be quoted in full. "Phlyctenular conjunctivitis is a disease of unknown aetiology but predisposed to by tuberculous infection (not always present), enlarged tonsils and adenoids, frequent colds, overcrowding, dirt and malnutrition. There seems to be reasonable ground for attributing the cause to endogenous toxaemia."

ERNEST THOMSON.

BOOK NOTICES

Contributions to Ophthalmic Science. Dedicated to Dr. Edward Jackson. Menasha, Winsconsin: George Banta Publishing Co. 1926.

At a meeting of the American Academy of Ophthalmology and Oto-Laryngology in 1923, Dr. Bedell of Albany proposed that some special token of appreciation should be given to Dr. Edward Jackson in recognition of his distinguished and unselfish service to ophthalmology. The proposal was received with enthusiasm, a Committee was appointed and the result is seen in the volume of "Contributions to Ophthalmic Science," recently published and dedicated to Dr. Jackson "in honour of his seventieth birthday."

This collection of 50 original papers forms a worthy tribute from "his pupils and colleagues" to one who is in every sense deserving of these evidences of admiration and affection. It is a handsome volume of over 300 pages, with a list of contributors (of whom unfortunately two have died since the scheme was initiated) and subscribers. It has been sent to every subscriber to the *American Journal of Ophthalmology*, of which Dr. Jackson is the editor-in-chief.

The articles contained in the volume deal with a wide variety of ophthalmological subjects: many of them are long and detailed and deserving of individual notice which we hope to give later. A large number are illustrated, some very liberally: others have valuable bibliographies appended. The frontispiece is, of course, a portrait of Dr. Jackson. The production of the book—paper, type, and illustrations—shows a high degree of excellence. In an appreciative and sympathetic "foreword" Dr. de Schweinitz relates the salient facts in Dr. Jackson's long and successful career and refers to the outstanding traits in his character and his professional work which have gained for him so high and so wide a reputation. The last paragraph of this foreword runs as follows: "His sterling character, his honesty of purpose, his scientific attainments and accuracy, his qualities of leadership, his abilities as teacher, author and editor, have established his wide reputation and made him an exemplar among the men of worth. For all time he has set his distinctive mark on our science. It is our privilege and pleasure in the dedication of this volume to pay tribute to our friend, teacher, co-worker and colleague—a master ophthalmologist."

To these happily chosen words of de Schweinitz ophthalmologists in this country who know and admire, or who not knowing still admire, Dr. Jackson, will subscribe in all sincerity.

Ophthalmic Nursing. By MAURICE H. WHITING, with Introduction by Sir John Parsons. 51 illustrations. Pp. 12 + 173. London: J. & A. Churchill. 1926. Price 5s.

In spite of the fact that there are a good many small textbooks on ophthalmic nursing available, there was room for such a work as the present, in which the subject is concisely treated and in which speculative methods, the joy of the therapeutic crank, are omitted; moreover the book is brought out at a cheap price, which is a very important matter as most nurses and not a few students are not in a position to spend much money on books dealing with the special subjects.

The work is based on the methods in use at the Royal London Ophthalmic Hospital; and, as Sir John Parsons says in his foreword, these have stood the test of more than a century's experience. The book is liberally illustrated; the descriptions of the various diseases and operations are admirably concise and are all that is necessary to enable any intelligent nurse to understand the main facts of ophthalmic surgery, while paper and printing are excellent. Without aspiring to the high standard set by, say, the English liturgy in literature, the book is well written, and is obviously the work of one who has held the important post of House Surgeon at Moorfields Hospital and profited by the experience there gained.

Aphasia. By S. A. KINNIER WILSON, M.D., F.R.C.P. Pp. 108. London: Kegan Paul, Trench, Trubner & Co. 1926. Price 2s. 6d.

This little volume is one of the Psyche miniatures, and, as the author notes in his preface, the space at his disposal is not adequate for the full discussion of such a many-sided problem as that of aphasia. He is to be congratulated on the amount of information he has succeeded in condensing as well as on his effort to indicate the separate and combined importance of the anatomical, physiological and psychological aspects of the problem. Naturally in such a condensed account all sides of the question cannot meet with an equally full treatment and, in this case, the psychological side has had rather to give way to the physiological and pathological questions involved. The chief interest to the ophthalmologist will be found in the remarks on word-blindness which is classified as a form of receptive aphasia. In the matter of treatment Wilson strongly favours the re-education methods described by Dana. Although the author hopes that a definite physio-pathological classification of the forms of aphasia may yet be attained he is forced to admit that so far we must be content with empirical clinical divisions. In spite of its unscientific appearance we can recommend the book to our readers as a very clearly written introduction to a difficult subject.

OBITUARY NOTICE

DR. EDMOND LANDOLT

On May 9 last there passed away in the person of Dr. Edmond Landolt a link between the heroes of ophthalmology of a previous generation and the specialists of the present day. He worked as a pupil under Helmholtz, von Graefe, Snellen, and Donders, and published his first book in Paris nearly fifty years ago.

Landolt was born in Switzerland of a French mother and a Swiss father. He came to France during the war in 1871 with a Swiss ambulance hospital, and was present at the battles around Belfort, where he contracted enteric fever. After study and practice at Utrecht and in Germany he established himself in Paris in 1874, working particularly with Charcot, at the Salpêtrière. Later he was offered the chair of ophthalmology at Berne, and also at Zurich, but having become oculist to the Institution Nationale des Jeunes Aveugles he preferred to remain in Paris, where with Panas and Poncet he re-founded the *Archives d'Ophtalmologie*, which had ceased publication many years previously. In 1882, with de Wecker, he published a complete treatise on ophthalmology, while many translations of his works have been published in England and America. He also contributed with Snellen an important volume to the second edition of the Graefe-Saemisch Handbuch.

He was particularly interested in the action of the ocular muscles and their disorders, and will go down in history as the pioneer of their study and treatment. In 1911 he delivered the Bowman Lecture, and was made an honorary member of the Ophthalmological Society of the United Kingdom. The last of his many visits to England was in 1924, for the Oxford Ophthalmological Congress, where he read a communication on strabismus: those who were present will remember his pathetic forecast that it would be his last visit.

In addition to his outstanding merit as an ophthalmologist he was conspicuous for his tact and charm of manner. He received much royal patronage as shown by the Orders he held. In addition to the 1870-71 medal and the rosette of the Legion of Honour, they included those of Spain, Italy, Roumania, Greece, and Turkey.

Of distinguished appearance, he was a man of the world, an interesting companion, and an affectionate friend. He leaves a widow and two sons; Dr. Fernand Landolt, a laryngologist, who was very severely wounded in the war, and Dr. Marc Landolt, who is a member of the Ophthalmological Society of the United Kingdom. We desire to express our profound sympathy in their loss.

NOTES

Death

WE regret to record the death of Lt.-Colonel Lionel John Pisani, F.R.C.S., I.M.S. (retired) on June 22. He held the post of Ophthalmological Surgeon to the Metropolitan Hospital.

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Birthday Honour

WE desire to congratulate Mr. Ernest Clarke, who has been elected President of the Ophthalmological Section of the Royal Society of Medicine, on the honour of Commander of the Royal Victorian Order conferred upon him by the King.

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Royal Society of Medicine

THE following have been elected as officers of the Ophthalmological Section for 1926-27 :— *President* : Ernest Clarke, C.V.O. *Vice-Presidents* : H. B. Grimsdale, Leslie Paton, Cyril H. Walker, A. L. Whitehead, Elmore W. Brewerton, A. H. H. Sinclair, Sir Arnold Lawson, K.B.E. *Honorary Secretaries* : A. H. Levy, J. F. Cunningham, O.B.E. *Other Members of Council: Physicians* : Anthony Feiling, E. Farquhar Buzzard, James Stansfield Collier. *Metropolitan Members* : P. G. Doyne, R. Affleck Greeves, A. C. Hudson, Montague L. Hine, H. Rowe Jeremy, F. A. Williamson-Noble, Ida Mann, R. Foster Moore, Humphrey Neame. *Provincial Members* : G. H. Pooley, J. A. Valentine, A. J. Ballantyne, R. J. Coulter, J. Wharton, William G. Laws. *Representative on Library Committee (Honorary Librarian of the Bowman Library)* : F. A. Williamson-Noble. *Representative on Editorial Committee* : A. H. Levy.

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Advanced Course in Ophthalmology

THE medical faculty of Lyons will hold an advanced course in ophthalmology beginning on November 8, 1926, and lasting for two weeks. Professor Rollet will be assisted by Drs. Colbat, Bussy, Rosnoblet, and Malot in conducting the course which will include clinical and practical work in all branches of ophthalmology. The library with its large collection of periodicals and works on ophthalmology will be open to those taking the course and a certificate of attendance will be presented to them. Intending students must register at the Secretariat of the Faculty of Medicine, quai Claude-Bernard, Lyon. The fee has been fixed at 150 francs.